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Magazine

Super Sound's Mysteries

Suburbia vs. The City

Why Better Mail Service

Rx to Prevent Accidents

Businessman's Airport

Progress For the Rails

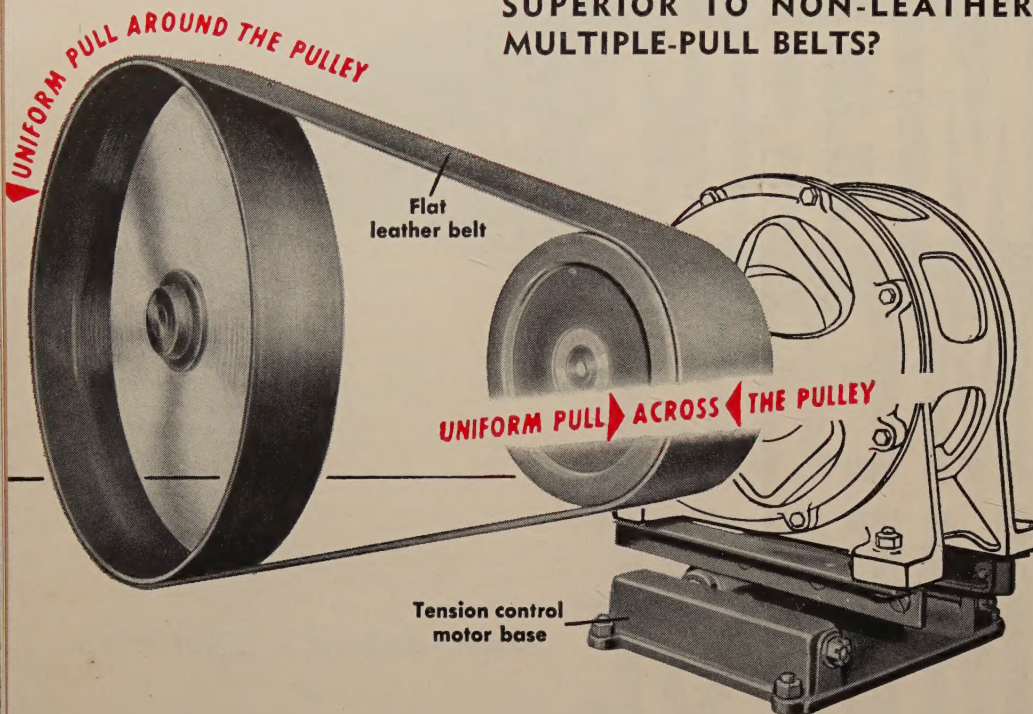
January, 1954 • 35c

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Chicago Business

	Nov., 1953	Oct., 1953	Nov., 1952
Building permits _____	642	888	57
Cost _____ \$	11,861,300	\$ 20,949,400	\$ 19,763,600
Contracts awarded on building projects, Cook Co. _____	2,096	1,657	1,200
Cost _____ \$	46,771,000	\$ 44,444,000	\$ 41,769,000
(F. W. Dodge Corp.)			
Real estate transfers _____	6,961	7,922	5,900
Consideration _____ \$	4,402,949	\$ 6,544,899	\$ 5,809,600
Department store sales index _____	136.9	112.1	122
(Federal Reserve Board)			
(Daily average 1947-49 = 100)			
Bank clearings _____	\$ 3,823,321,637	\$ 4,031,915,997	\$ 3,501,589,500
Bank debits to individual accounts:			
7th Federal Reserve District _____	\$21,749,000,000	\$23,121,000,000	\$19,388,000,000
Chicago only _____	\$10,937,563,000	\$11,670,476,000	\$ 9,689,023,000
(Federal Reserve Board)			
Bank loans (outstanding) _____	\$ 2,798,000,000	\$ 2,800,000,000	\$ 2,687,000,000
Midwest Stock Exchange transactions:			
Number of shares traded _____	1,067,189	1,088,000	1,189,000
Market value of shares traded _____ \$	32,706,982	\$ 36,603,242	\$ 35,225,500
Railway express shipments, Chicago area _____	1,007,127	1,061,634	1,084,500
Air express shipments, Chicago area _____	56,208	67,286	58,800
L.C.L. merchandise cars _____	17,309	20,980	17,300
Electric power production, kwh _____	1,320,578,000	1,360,362,000	1,280,114,000
Industrial gas sales, therms _____	14,096,415	14,188,050	13,390,800
Steel Production (net tons) _____	1,660,500	1,717,700	1,706,200
Revenue passengers carried by Chicago Transit Authority lines:			
Surface division _____	46,061,195	49,583,028	47,431,500
Rapid transit division _____	11,813,738	12,463,509	11,153,200
Postal receipts _____ \$	13,229,021	\$ 13,449,090	\$ 11,782,000
Air passengers:			
Arrivals _____	255,367	309,789	221,900
Departures _____	269,292	321,782	224,600
Consumer Price Index (1947-49 = 100) _____	116.4	117.1	115
Receipts of salable livestock _____	508,386	473,474	480,400
Unemployment compensation claimants, Cook and DuPage Counties _____	25,787	23,786	20,200
Families on relief rolls:			
Cook County _____	16,470	16,379	18,400
Other Illinois counties _____	11,760	11,350	11,400

February, 1954, Tax Calendar

Date Due	Tax	Returnable to
15	If total O.A.B. taxes (employer and employee) plus income tax withheld in previous month exceeds \$100, pay amount to	Authorized Depositor
15	Illinois Retailers' Occupation Tax return and payment for month of January	Director of Revenue (Ill.)
15	Annual Federal Information returns. This is calendar year 1953 report — not fiscal. (Forms 1096 and 1099). 1099 not required on wages reported on Form W-2 (Rev.)	Commissioner of Internal Revenue, c/o Processing Div. Pratt Whitney Plant, Kansas City, Mo.
28	Last day for filing of annual Franchise Tax Report without penalty by domestic and foreign corporations. Based on calendar year 1954 or end of fiscal year preceding December 31, 1953	Secretary of State

COMMERCE

Magazine

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on Sturdy, Editor • Gordon Rice, Advertising Manager • Gordon Ewen, Associate Editor

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in this
issue...

Like motels and drive-in theaters, the new suburban shopping centers are tailored to the automobile age. Convenience is their great asset. Grant Ellis tells (page 11) their rising challenge to long-established downtown shopping districts like State Street and what is being done to meet that challenge.

• • •

Ultrasonics is sound pitched so high that you can't hear it. Industry uses it to detect flaws in metal, and one company cleans electric shaver heads with it. In a few minutes it has aged whiskey several years, and it has shattered human gallstones transplanted in rabbits and a dog without harming them. Lee Hancock describes (page 14) the great potential of ultrasonics and the problems that continue to baffle scientists attempting to harness it.

• • •

William White, president of the New York Central, challenges (page 19) the "depression thinking" directed by many investors at railroad securities in a piece entitled "The Positive Side of the Tracks." If you're one of those who consider railroading a more or less static industry, you'll find White marshaling an impressive array of facts to the contrary.

• • •

For years the company doctor has been a handy man to have around, but recently he has taken on added importance. Phil Hirsch explains (page 16) how the concept of job-placement physical exams has achieved remarkable results in accident prevention and cost saving.

• • •

The register at Chicago's lake-front airport, Meigs Field, reads like a Blue Book of American industry. More and more companies are taking advantage of its close-to-the-Loop location to land their planes. Mel Sokol tells (page 21) how Meigs has prepared to meet the doubling of the nation's business air-fleet that is expected to occur in the next two years.

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The Editor's Page

Years of Accomplishment

A few days ago it was announced that Leverett Lyon would retire on January 1 as chief executive officer of the Chicago Association of Commerce and Industry, concluding 14 years in which he has provided continuing leadership for this organization.

This 14-year period was momentous in the history of the country, the city, and the Association. It encompassed World War II, victory and peace, cold war and the Korean war. For Chicago it brought the most rapid industrial expansion in the city's history and a greater addition to its manufacturing capacity than was achieved during the same period by any other city in the country. It also brought a multitude of extremely difficult civic problems.

The Association under Mr. Lyon's leadership contributed importantly to the solution of many of these problems. The list is too long to recount here but outstanding are such things as the new building code, which the Association fostered from the beginning. The plan to ease the city's acute parking problem, which is now being carried out, was conceived as a result of a comprehensive study made under the Association's direction and financed jointly by the Association and the State Street Council. The legislation which has made it possible finally to start slum clearance and out of which such projects as the New York Life Insurance Company's Lake Meadows project have grown, was conceived by the Association and given assistance through the lengthy process of law making at Springfield.

Innumerable economies in the city's government grew out of studies financed and directed by the Association. These are but a few of the many difficult accomplishments achieved by the Association during Mr. Lyon's 14 years as its chief executive officer.

His leadership has not been noisy. Blatant publicity had no part in it. Many very significant accomplishments scarcely found their way into print, let alone into headlines. But they stand in the record and the community will long benefit from them.

Mr. Lyon came to the Association from the academic world. He brought with him the scholar's approach to problems plus a businessman's initiative. His methods were thorough study and analysis, development of a program, and then action.

Although he is retiring as chief executive officer, he will not be inactive. As chairman of the Association's executive committee his advice and counsel will be available. He will also now be able to concentrate a large part of his attention on his responsibilities as chairman of the Chicago Home Rule Commission, which was recently created by the City Council on the recommendation of Mayor Kennelly. In this work his extensive knowledge of the city's problems and his demonstrated talents for reconciling conflicting viewpoints and bringing about constructive action will be invaluable.

Mr. Lyon has aptly been called "one of Chicago's most useful citizens." It is fortunate for the community that the officers and directors of the Association and Mayor Kennelly did not permit his usefulness to come to an end merely because he had reached retirement age.

We'll Be Doggoned

An editor is literally besieged with statistics and of necessity becomes quite blasé about them. But every once in a while some startling bit of information comes along that can't be lightly dismissed.

Recently the American Can Company as a result of a scientific survey came up with these amazing facts. Our otherwise fair country has a total of 49.3 million cats and dogs, with cats outnumbering the dogs 26.7 million to 22.6 million. This four-footed horde consumed more than 1½ billion cans of pet food in 1953, earned by the sweat of their masters' brow while they, no doubt, lolled luxuriantly on the best piece of furniture in the living room.

American Can's study further reveals that our dog and cat population exceeds the number of families in the country by more than eight million. Incidentally, the average family owning cats has an average of 2.21 while dog owners harbor an average of 1.34.

What all these weighty statistics prove we are not quite sure. Perhaps it is that an awful lot of American families, including the writer's, are soft touches for some smart dog or cat or both.

Add Statistics

How big is government in this country?

By actual count, according to the Chamber of Commerce of the United States, there are 116,743 major units of government in the United States today.

If the total were broken down into all the principal subdivisions of government, it would be many times 116,743. Within the federal government alone there are 13 departments, nine agencies, 19 commissions, 29 administrations, 22 corporations, 630 offices, 127 services, 107 bureaus, 627 divisions, 32 branches, 58 boards, and 444 miscellaneous units such as missions, colleges, commands, projects, etc., making a total of 2,117 distinct segments of federal government. Breaking down state and local governments into subdivisions would add still more to the 116,743 total.

What does all of this cost? A neat \$101.5 billion, annually or \$646 for every man, woman and child in the United States.

Alan Sturdy

the Matador



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Here...There... and Everywhere

• **The Peak Years** — The thirties are man's most creative age in the arts and sciences but greatest leadership comes in the fifties, concludes Harvey C. Lehman in his new book, "Age and Achievement." The typical creative thinker produces valuable work most of his life with his creativity declining only slowly from its early peak. Chemists make most of their important contributions when they are 30 to 34. The time gap between creativity and leadership appears to be increasing, Lehman says. A study of cabinet members from 1789 to 1824 shows a median age of 46; from 1925 to 1945 it was 60. The greatest number of top ranking Civil War generals were between 40 and 44; in World War II the peak ages were 57 to 61. Most college presidents are 50 to 54 and most U. S. senators are 60 to 64.

• **On the Road to Mecca** — There is only one sign on the 32-mile paved highway between Jedda and the holy city of Mecca in Saudi Arabia. You guessed it: it advertises an American product. The 3-by-7-foot Scotch-lite sign shows an Admiral refrigerator loaded with food, and an Arabic inscription proclaims: Beautiful Modern Guaranteed Refrigerators Will Serve You Many Years. Approximately 1,000,000 persons will pass the sign from May to August as they ride on camels or in automobiles, or walk to Mecca.

• **We're on the Move** — One of the things that distinguish the United States from the rest of the world is the tremendous mobility of our population. A sample survey taken by the Bureau of Census shows that one-fifth of the civilian population changed their places of residence in each year between 1947 and 1952. Between April, 1951, and April, 1952, the number who moved exceeded 30 million. The majority

of movers stayed within the same community or nearby areas, but millions found new homes across state lines. The ability and willingness of Americans to move to take advantage of an opportunity some place else is a factor making for a dynamic economy.

• **Elevator TV** — Closed circuit television recently found a new commercial use. Chicago's Merchandise Mart, the world's largest commercial building, had a peculiar daily traffic problem because the 15,000 persons who work there enter and leave in roughly equal numbers both from the first floor and from the second floor elevated station entrance. During rush hours the first floor started to jam and the second floor could only guess at the jam developing on the second floor. To solve this the Mart installed a new RCA "TV camera eye" at the second floor elevator entrance. A 21-inch receiver is located on the first floor where the jam can be watched closely by the starter.

• **Home on the Wheels** — Some 2,000,000 Americans now live in mobile homes (house trailers) and the average income is \$1,000 above the national average. The group's population, according to the Mobile Home Manufacturers Association, is increasing at an annual rate of 25%. Since 1937 annual sales of the trailer industry have increased from \$17 million to over \$300 million today. If you're interested in this type of living but can't convince your wife, the association says that you can tell her that she'll spend one-fourth as much time on housework as she is now.

• **The Labor Market** — Chicago has the tightest labor market of any major city in the country and Detroit the greatest amount of unemployment in relation to its local labor force, says the Federal Reserve Bank of Chicago. A substantial su-

polus of jobs is declared to be available here for relatively qualified workers. Pressing Chicago for top employment honors is Minneapolis-St. Paul, according to the bank.

• **Executive's Pay** — Top executives found little to cheer about when they reviewed their 1952 compensation. A survey by the American Management Association of 15,000 business leaders from 1,868 companies showed an increase of less than 1 per cent in their total compensation against a 7.4 per cent increase in the gross weekly earnings of the average production worker. Salaries of the top executives rose 4 per cent from 1951, but this was offset by a drop of 11.7 per cent in bonuses and 3 per cent in company retirement contributions. Despite their drop, bonus payments were equal to 43.6 per cent of salaries and retirement contributions to 13 per cent.

• **Leave City Behind** — The suburbs and unincorporated areas around Chicago continue to pull farther and farther ahead of the central city in home building. As measured by the Bell Savings and Loan Association's compilation of home and apartment building permits, the territory around Chicago built 2.5 times as many new living units as Chicago in the first eleven months of 1953. In the same 1952 period the ratio was 2.2 to 1 and in 1951 it was only 1.9 to 1. Suburban towns, in the recent eleven months, issued permits for 19,956 homes valued at \$256 million, unincorporated areas for 6,745 homes at \$79 million, and Chicago 8,022 homes at \$86 million. Chicago led in apartment units with 2,955 at \$25 million followed by suburban towns with 889 units at \$8 million and unincorporated areas with 6 units at \$36,500. The total for the complete area was \$454 million against \$371 million last year. The area studied is bounded by Waukegan on the north, Elgin, Aurora and Joliet on the west, Gary on the south.

• **Embezzlement Boom** — Most businesses would like to have a sales curve that followed the zooming postwar pattern of bank embezzlements. Back in 1946 a modest 289 embezzlements were reported to the FBI, and the figure has risen every

(Continued on page 32)

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SUBURBIA VS. THE CITY:

Neither Holds All Aces In Battle For Shoppers

By GRANT ELLIS

**State Street is making plans to meet the competition
of the mushrooming new suburban shopping centers**

HOW much do suburban shopping areas threaten retail business houses in the heart of the city? Will these outlying trading centers someday eclipse their city competitors like the automobile overshadowed the horse and buggy?

The answers to these vital questions lie buried beneath a tangled skein of problems that plague every aging city — lack of parking space, inadequate public transportation, choked highways and slums. Intertwined as it is with these matters, the ultimate fate of older downtown business areas will not be decided suddenly by any one dramatic turn of events. Rather, it will be a long, slow process in which the complexion of entire cities will change to meet the modern needs of the public, in whose hands the final answer lies.

"We have only scratched the surface of what must be done by our own businesses and the downtown community as a whole," prophesied Lawrence B. Sizer, vice-president of Marshall Field and Company and chairman of the board of the State Street Council, speaking to newly elected officers and directors of the Council early last year.

"We must choose between the al-

ternatives of building our businesses or bowing before the march of events that threaten our dominance in the retail life of this area. . . . The next decade will pretty much decide the degree of emphasis that can wisely be placed on decentralization. . . ."

The "march of events" began back in the 1920's, when prosperity and the automobile spurred the exodus to the suburbs. In the words of James C. Downs, Jr., president of Chicago's Real Estate Research Corporation the movement from the big cities was "implemented by electricity, petroleum and rubber," and "aggravated by racketeering, taxes and traffic."

Branches Spring Up

The expatriates took with them a tremendous block of purchasing power, and, quite naturally, branch stores sprang up in the suburbs to serve their needs.

While the trend toward decentralization continued steadily up to World War II, it was after V-J Day that the suburbs began to mushroom fantastically. Record earnings, high birth and marriage rates and other sociological changes were contributing factors. In a year or two, old towns and villages were surrounded by hundreds of new homes. Entire new cities, such as Park Forest, Illi-

nois, and Levittown, New York, sprouted in response to the pent-up demand for housing. Census figures mirror the magnitude of this growth: suburban population of the U.S. jumped 35.6 per cent during the decade following 1940 while the cities increased only 13.9 per cent.

Auto sales, restricted by four years of war, also jumped dramatically. The number of cars rose from 25 million in 1945 to 40 million in 1950 — figures that readily explain the ever-worsening traffic congestion in major cities.

Howard T. Fisher, Chicago architect whose firm has designed some huge new shopping centers, thinks that traffic congestion has been largely responsible for the lusty growth of suburban business areas. A handmaiden of traffic congestion, according to Fisher, is the shortage of parking space in metropolitan areas.

Transportation Consultant John Miller agrees. Writing in the Bulletin of the National Retail Dry Goods Association, he gives this explanation; "A one-story factory covering one acre of ground needs an additional acre of space for employees to park. A department store, however, requires three or four times as much parking space. . . . A four-story department store needs a 12-story garage for its customers.

"On this basis, more than half the

Fred G. Korth photo

ground in business . . . districts [ought to be] devoted to auto parking. . . ."

Real estate close to established business districts is so high-priced that creation of ample parking facilities would be fantastically expensive. But out in suburbia, the situation is different. Lincoln Village, a new development in northern Chicago, provides free space for over 1,300 automobiles. And the gigantic new shopping center at Flushing, near New York City, offers shoppers 5,000 covered parking spaces! This, plus the shorter distance between home and shopping center, enables these new retail outlets to offer supreme convenience to the customer.

Boston Survey

What is probably the best measure of the impact of suburbia on downtown business firms comes from Boston where the *Herald Traveler* recently conducted a survey. Two faculty members of Boston University's College of Business Administration spent ten months interviewing women shoppers throughout Greater Boston. The survey area extended over a circular area about 30 miles around the core of the city. This sprawling region contains 30 shopping districts and roughly three million people.

Women surveyed reported buying half their clothing in suburban stores and half downtown. Women's accessories were 53 per cent in favor of the suburbs and 66 per cent of all children's wear was reported bought in suburbia. Men's wear and home furnishings were 51 per cent in favor of downtown, but in the electrical appliance field, 56 per cent of the interviewees bought in suburban stores.

Just as significant are the complaints listed by the shoppers. Thirty-five per cent did not like the choice of merchandise available in suburban shops. Six per cent said the same thing about downtown. Prices in outlying stores drew objections from 38 out of every one hundred shoppers, while only 14 per hundred complained about prices in downtown stores. Delivery service rated a 26 per cent complaint ratio in suburbia, as against only 10 per cent downtown. And the range of sizes and colors available in suburban

outlets caused 32 per cent to complain as against only eight per cent for metropolitan stores.

The Boston survey confirmed the established idea that convenience is the main advantage offered by suburban stores. Only 11 per cent of the respondents complained about the difficulty of getting to suburban stores, while 47 per cent objected to metropolitan shopping areas on this ground. Another eye-opener: 43 per cent of the Boston shoppers complained about the attitude of sales personnel downtown. The corresponding figure for suburban stores was just 11 per cent. The handling of adjustments in metropolitan stores drew 21 complaints per hundred shoppers queried, as against 11 for outlying stores. And 33 per cent complained about "shopping discomfort" in city stores as against only 8 per cent in the suburbs.

Altogether 40 per cent of the women interviewed said they were shopping less downtown. They attributed the change to sickness and other "natural causes." The biggest group—13 per cent—said children were the reason why they shop closer to home. This seems to explain why the merchants in outlying regions of Boston have won predominance in the infant wear market.

Comfort and superior service were given as reasons for suburban shopping by 16 per cent, and 30 per cent said transportation difficulties caused them to buy in outlying stores.

How They Get There

One of the most significant findings concerned methods by which the shoppers reached the downtown area. About half used public transportation. Only 22 per cent drove their cars and only seven per cent said that traffic tangles and shortage of parking space kept them away from the downtown shopping area! A similar survey in Columbus, Ohio showed the opposite—that traffic tangles and poor parking *did* drive away business. Otherwise, the findings in Columbus and Boston were similar.

The two favorite shopping areas outside of downtown Boston are modern, well-planned centers, one far from the heart of the city and the other fairly close. Oddly enough, the third most favored shopping site is an old one located in Quincy, not too far from downtown Boston. The

reason for its popularity: The merchants have a progressive attitude and have, to some degree, solved the parking problem.

Generally speaking, this survey showed the older, downtown area was preferred by shoppers seeking style goods—chic fashions and all sorts of elegant finery. Too, shoppers like the downtown area because it offered a greater variety of merchandise, stylewise and pricewise.

Conversely, suburban stores have greater appeal for brand items such as appliances. Notice also that the huge post-war crop of children played a significant part in the swing to suburbia.

Meaning for Chicago

How do these findings apply to downtown Chicago and the 35 major shopping areas outside the Loop? Will the Boston study help businessmen along State, Wabash and Michigan Avenue find an answer to their problem?

State Street Council President Randall H. Cooper considers the Boston survey highly significant. It confirms his theory that State Street will continue to prosper because of the immense variety of stores that offer shoppers one of the world's most varied and appealing selection of goods.

"The Boston Survey shows that choice of style and price is the major attraction of a downtown area such as ours," says Cooper. "This has always been State Street's stock in trade. Admittedly, outlying business centers pose a problem for downtown business interests. The problem is not insoluble, however. In Chicago, the business habit pattern of the public has traditionally been pointed toward the central downtown area. This is because downtown Chicago offers diversity in size and stability in size and products . . ."

Cooper blames "the barrage of publicity given to suburban trading areas" for the fact that "some downtown businessmen show a tendency to overlook potentialities that are still inherent in the downtown section . . ."

That the leaders of business and industry in Chicago feel similarly optimistic is indicated by the fact that since 1945, over \$60 million has

(Continued from page 35)



Mail-toting helicopter comes in for a landing on the roof of Chicago's post office

WHY MAIL DELIVERIES ARE IMPROVING

Ike's team has put management skills to work in the Post Office

WITHOUT being acutely aware of it, have you had the feeling that delivery of your mail has been improving lately?

There are firm grounds for such a feeling, and the chances are that mail deliveries will continue to improve.

When President Eisenhower took office almost a year ago, his goal was to give better government service for less money. This goal had a definite application for the Post Office department, for years one of the biggest drains on the taxpayer's dollar outside of expenditures for national defense.

The new Postmaster General, ex-Chevrolet dealer Arthur Summerfield, and his supporting cast of



Economical HPO—highway post office—is becoming increasingly familiar sight

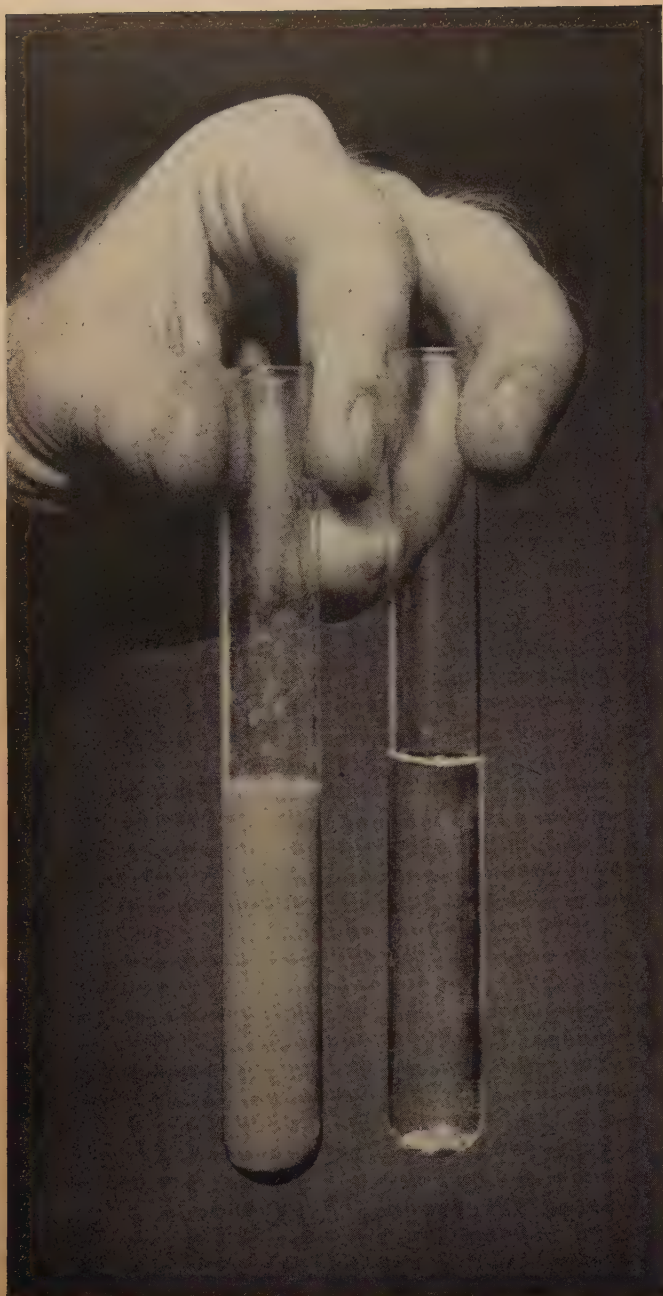
officials recruited from the ranks of business management soon discovered that the main economies had to be achieved by some other means than cuts in personnel. Manpower continued to be a must in the job of giving individual handling to the millions of letters and other mailing pieces going to millions of separate addresses.

One experiment tried by the department has been to send regular mail between Washington and Chicago by air. The experiment was undertaken not to speed delivery but primarily to save money. It also means that a letter put in a Washington postbox in the afternoon will

(Continued on page 26)

By

JACK ROBINS



All the egg-beaters in the world can't make a stable mixture of mercury and water, but ultrasonics can. The test tube on the left contains mercury and water homogenized by ultrasonic waves. The righthand tube holds water with a drop of mercury.

REMEMBER the loudest crash of thunder you ever heard. Multiply the noise several thousand times. That's ultra-sound, more commonly known as ultrasonics, science's baffling new tool which produces a series of blasts, shrieks, howls and roars so intense they are beyond the range of human hearing. Ultrasonics and supersonics started out to mean the same thing. Now it is generally accepted by scientists that supersonic refers to speed faster

than sound, as with jet planes, while ultrasonic applies to sound above the audible range.

You've read a lot of ballyhoo in the last few years about ultrasonics moving into your home, cooking food, washing clothes, and making the housefly nothing but an unpleasant memory. But these practical applications are still in the offing and meanwhile, researchers are making progress.

At the University of California,



You can start fire with sound. High frequency waves from the air whistle were focused on the cotton by the headlight reflector. The waves agitated the cotton starting fire by friction.

THE MYSTERY

Dr. Irving Rudnick has learned how to light his pipe with an ultrasonic siren. With it he has boiled coffee and washed clothes. He has killed white mice by exposing them for one minute to ultrasonic waves, and has learned that much lower frequencies will kill mosquitoes.

The men at the General Electric Laboratories in Schenectady have accomplished much the same things with a tiny ultrasonic steel whistle, smaller than a cigaret.

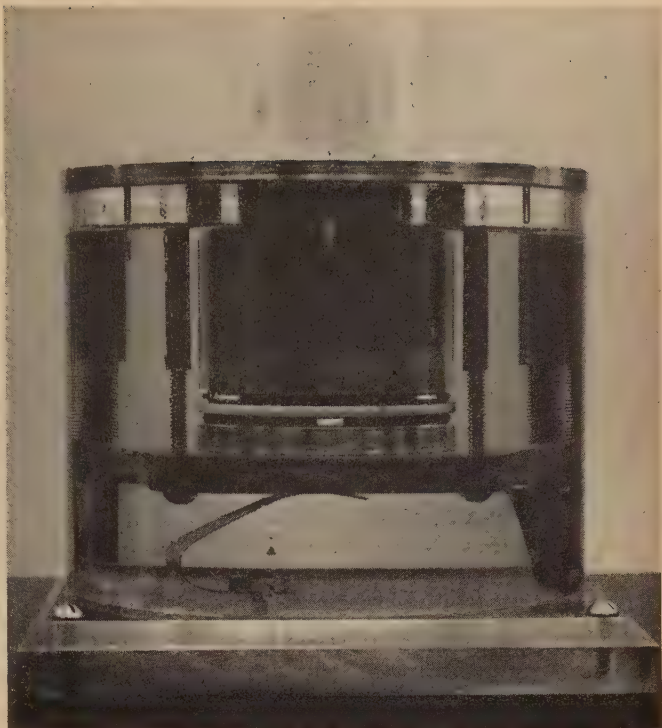
The Damon Runyon Cancer Memorial Fund is engaged in research work on the effects of ultrasonics on cancer.

Shatters Gallstones

The Naval Medical Research Institute is experimenting with ultrasonics to detect and locate bullets, fragments of glass in the body, or even gallstones and kidney stones. Dr. Harold Lamport of Yale School of Medicine, and Dr. Herbert E. Newman and Dr. Ralph Eichorn of



This is a device for discovering flaws in metal and other solids. The drumstick-like objects are an ultrasonic generator and receiver handling million-cycle-per-second sound waves.



Heart of this ultrasonics generator is a thin, quartz crystal disk in an oil-filled plastic case. Voltage applied across the disk vibrates it and generates high pitched sound waves.

OF THE SOUND THAT CAN'T BE HEARD

Beth Israel Hospital in New York have shattered gallstones in anesthetized rabbits and a dog. The gallstones in these experiments were human ones, placed inside the animals' intestines and then treated with a burst of ultra-sound. The doctors reported no damage to surrounding tissue although about 80% of the gallstones were fragmented. The rabbits and the dog recovered nicely from this experience.

Food processors are interested because of the proved ability of ultrasonics to blend materials. In laboratory experiments, ultrasonic waves have been able to homogenize mercury and water, a trick so far accomplished by no other means. Manufacturers of mayonnaise, French dressing and peanut butter hope to utilize this method to produce smoother, non-separating mixtures.

There is one application of ultrasonics in medicine that American doctors are watching hopefully. Now intravenous feeding of patients un-

Someday ultrasonics should help run your business and home, but science is finding its problems baffling

By LEE HANCOCK

able to take food by mouth is limited largely to the injection of glucose; because of the ability of sound waves to break materials into minute particles, medical men are hoping that it will be possible to reduce fats and proteins to a consistency that will make possible intravenous feeding of these two substances.

Russia is experimenting with ultrasonics, too. There two research workers bombarded potatoes and pea seeds with sound waves of 400,000 cycles a second. The seeds sprouted earlier, produced much greater yields.

Whisky has been aged several years in a few minutes by ultrasonics.

If ultrasonics can do all of these things, why hasn't it moved out of the laboratories and into the nation's homes and hospitals? Well, before we answer that, let's take a closer look at this amazing new product of scientific research, and see what's happened to it since its discovery at the end of the 19th century.

Sound of any kind is, of course, the result of vibration. Ultrasonics are sound waves which vibrate so fast people can't hear them. Most people can hear sounds caused by

(Continued on page 24)

Your Company Doctor Can Make An

Rx for Accident Prevention

By PHIL HIRSCH

OFFICIALS at the East Peoria plant of the Caterpillar Tractor Company claim that they operate "the safest tractor factory in the world." For proof, they cite the company's 1952 accident record, which was less than one-fourth the average for the agricultural implement industry. Caterpillar had 2.75 disabling accidents per million man-hours. The U. S. Bureau of Labor Statistics' index for the industry was 12.7.

The East Peoria plant won its third award of honor from the National Safety Council in 1952. This is NSC's highest citation. The plant also won a merit award. On a wall of the safety department, there is a virtually unbroken string of these stretching back to 1946.

When you ask how this safety record was achieved, officials take you to the office of the sprawling plant's medical director, Dr. Harold Vonachen. Dr. Vonachen's name is identified by almost every industrial doctor in the country with the theory that accidents can be reduced, absenteeism can be cut, and production increased, if you prescribe, literally, the type of worker you need for a job, and then find the worker.

Any one of a thousand and one physical and emotional factors can throw the worker out of kilter with his job, Dr. Vonachen says. He believes these maladjustments are a primary cause of high accident and absentee rates, and low production figures.

Caterpillar's System

To remove the maladjustments, according to Caterpillar's medical director and several other industrial doctors, you have to set up "job-placement physical examinations." What they mean is that the physical requirements of each job must be analyzed, and then applicants must be screened for those who can meet these requirements. If the worker gets sick or injured after he is hired and can't meet the job standards, he must be transferred to a job that he can fill.

Some 27 years ago, Caterpillar became the first industrial firm in the

nation to start job-placement physical examinations. In the years that followed, a few other firms picked up the idea. But it wasn't until World War II that a significant percentage of the nation's industry jumped on the bandwagon.

Meanwhile, Caterpillar was developing a plan for checking the emotional makeup of its labor force. This phase of the job-placement program was set up in 1946, after the company had spent three years and \$25,000 on research, assisted by experts from Cornell University.

"I'd say, without hesitation, that at least 75 percent of our lost-time accidents are caused by physical or emotional factors," a Caterpillar safety expert told me. This is a testimonial to job-placement medical and emotional examinations when you consider that in 1934, the East Peoria plant had 50 disabling accidents per million man-hours, and 12 in 1940, compared to the 2.75



Physically below par, these job candidates are building up a work tolerance as a preliminary to full-time employment.



This applicant for a job at Western Electric requiring him to lift heavy objects is given a special check-up.



index in 1952, and an indicated 2.16 for 1953.

At Inland Steel Company, which has had job-placement physicals since 1937, the accident frequency index has dropped from 7.57 in 1936 to 1.59 in 1952. The rate dropped 60 percent in one year at the Chicago plant of Snap-On Tools after the firm's 500 employees were matched to their jobs, and given new jobs where necessary, by means of job-placement physicals.

In 1950, doctors at the Hawthorne works of the Western Electric Company noticed that too many workers assigned to heavy lifting jobs were suffering back injuries. They then established a special medical examination for all new workers who

would be lifting more than 25 pounds. They examined the worker's medical history, looking especially for previous back ailments. They weeded out new workers or transfers who were unusually tall or considerably overweight — either body type makes a poor lifter. The exam covered everything from the condition of the worker's arches to his ability to see at close range, and included such points as posture, pelvic tilt, length of legs, and condition of heart and circulatory system.

Last year, Western Electric doctors could say, justifiably, that they had eliminated the major cause of the back injuries.

The severity rate of back injuries declined from 122.3 lost days per

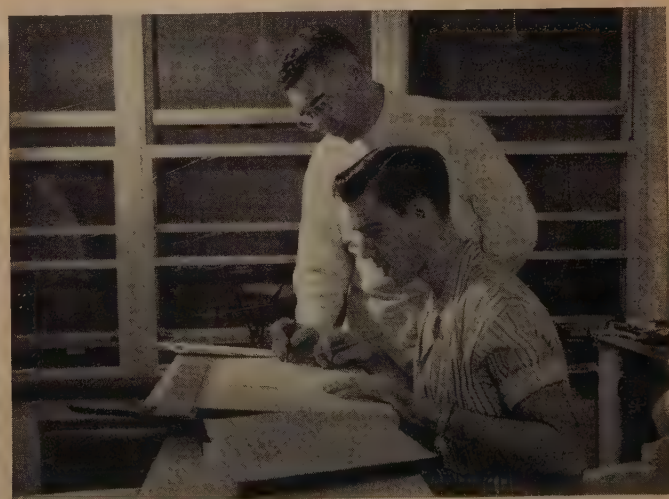
LEFT—Taking blood pressure is part of pre-employment examination at Inland Steel; RIGHT — Worker gets whirlpool treatment at Inland for injured foot.

1,000 workers in 1948 to 49.7 in 1952. During the same period, the frequency rate dropped from 3.48 accidents per 1,000 workers to 2.49.

The value of the job-placement physical in reducing accidents among regular workers is illustrated by the case of a driver for New York's Third Avenue Transit System. Since 1947, a company physician has examined every driver returning to work who has been sick for four days or more. The idea is to determine whether the driver has recovered enough to meet



Chest x-rays are a pre-employment "must" these days at many plants.



Teaching mathematics: Rehabilitation training to develop skill in a physically suitable new job at Caterpillar.

the physical requirements of his job.

One driver returned after a week's absence, explaining that he'd been laid low by an "upset stomach." The company physician, after examining him, became suspicious, and after several rather evasive answers, the driver finally admitted that he'd suffered a convulsive seizure.

The driver was taken off his bus run and given other work. Later, he suffered several more seizures. "It is apparent that the transfer prevented a serious disaster," commented Dr. Harold Brandaleone, Third Avenue's medical director.

Careful medical follow-up like this is a major reason why the firm's accident rate dropped almost 50 percent between 1946 and 1951.

"The annual cost of maintaining a good medical department is less than the cost of one severe accident," according to Dr. Brandaleone.

And at Caterpillar, according to the safety department, the direct loss from each disabling accident ranges from \$500 to \$1,000. This loss does not include the money that goes down the drain when an accident stops a production line. At Caterpillar, safety officials explain, at least 200 workers are idled for ten to 45 minutes every time there is an accident.

\$2.9 Billion Loss

The National Safety Council says that in 1952 the total time lost because of work injuries amounted to 250 million man-days. This included 45 million man-days lost by workers who were injured, and 205 million man-days lost by other workers when they stopped to help the injured man or to discuss the accident. The total cost of these work injuries, according to NSC, was \$2.9 billion.

Absenteeism may be even more of an industrial headache than accidents, according to Dr. R. B. O'Connor. Dr. O'Connor ought to know. He is the medical director, loss prevention department, Liberty Mutual Insurance Companies, one of the nation's largest underwriters of workmen's compensation insurance.

"The cost of group hospitalization insurance premiums in many plants is two to three times as much as their workmen's compensation premium," Dr. O'Connor reported recently. "Admittedly, insurance premiums do not represent the true total

dollar losses to industry from illness and injury. But we can get some ideas of relative magnitude of loss from a comparison of the two insurance premiums."

He added that a major function of the job-placement physical is to discover conditions that might cause illness and absenteeism. The validity of Dr. O'Connor's remarks is shown by the experience of the C. T. Dearing Company, Louisville, and the Allan Manufacturing Company, Hartford, Conn., where efficient medical programs which include job-placement physicals for new and regular workers have cut absenteeism 50 to 75 percent in the past five years.

Job Prescription

Because part of the job-placement medical program is to determine the physical requirements of each job in the plant, the doctor knows whether the injured or ill worker, after treatment, can meet the demands of his former position. If the worker can't handle the load, the doctor, by consulting a few other job descriptions, can usually find one that fits the worker's reduced capabilities.

Most companies usually list these job requirements on a file card. The card used by the Crane Company is typical. It lists 16 "physical factors," which include lifting, carrying, climbing, hearing, and seeing, and ten "environmental factors" — dust fumes and smoke; moving machinery; ladders; scaffolds, and amount of noise, among others.

When a worker comes in to be examined, the doctor knows from past analysis what the worker's job requires in terms of each of these factors. So, on the card, the doctor lists those factors for which the worker has "full capacity," "partial capacity," or "no capacity."

Similar systems are in effect at many other companies. At Caterpillar, there are several cases of workers with inadequate vision who, after obtaining new glasses, improved their production rates 100 to 200 percent. Eye tests and new glasses have increased workers' earnings up to 40 percent at the Greeneville, Tenn., plant of Magnavox Company, according to G. Luther Wiebel, the company's industrial relations director.

Possibly the greatest benefit of this physical capacity analysis has been in

pre-employment examinations. At the Crane Company 922 job applicants were given physicals in 1952. Of this number, about four per cent were rejected because they weren't able to meet the medical requirements of the particular jobs they had applied for. But these rejected applicants were sent back to the personnel office for reassignment to other positions, and most of them were eventually hired.

The workers who were rejected initially and later hired for other jobs had such maladies as high blood pressure, hernia, arrested cases of tuberculosis, and arthritis of the spine. Several had only one arm or one leg. These workers, many of them ex-GIs, are part of a vast group. According to the Bureau of Labor Statistics, "There are five to six million workers in this country who have disabilities serious enough to make it difficult for them to find gainful employment."

In 1948, BLS made a survey of the handicapped worker's ability to earn a paycheck which today is still a bible on the subject. The agency compared the production records, absentee and accident rates of some 11,000 impaired workers with those of 18,000 unimpaired workers in identical jobs.

BLS concluded: "When given reasonable job placement consideration — that is, the individual's abilities balanced against the job's requirements — the physically impaired workers as a group were fully able to compete successfully with unimpaired workers similarly placed. Impaired workers produced at a slightly better rate than did unimpaired workers on identical jobs. Both groups had identical frequency rates of non-disabling injury, and average rates of absenteeism showed only nominal differences."

TB Patients Hired

During a six-year period, Caterpillar hired 103 workers who brought with them arrested or inactive cases of tuberculosis. Of these, only three were disabled on the job, and all three, after treatment, returned to work.

"One of the great stumbling blocks in TB control has long been the stigma attached to the ex-sanitarium case who wants to work," explained

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THE POSITIVE SIDE OF THE TRACKS



N. Y. Central's Twentieth Century Limited in the Hudson River valley

It is common to hear of the problems of the railroad industry. The impression that the railroads are not progressive and do not carry on an adequate research program is also held by many people. In an address before the recent annual convention of the Investment Bankers Association of America, Mr. White, who is president of the New York Central System, offered convincing evidence that these ideas are misconceptions. His very interesting talk on the progress and prospects of the railroads is digested in this article.

THE RECORD OF RAILROAD PROGRESS

By WILLIAM WHITE

emphasizing truly that rail earnings are inadequate.

Railroads are regulated under the concept of monopoly, but the Congress and state legislatures, as well as pressure groups, have been either unwilling or too slow to recognize the transition from monopoly to keen competition.

We do not seek to destroy that regulation which, born of experience, has proved to be good; nor do we seek to destroy our competitors. In the final analysis, what we seek is the opportunity, under our capitalistic profit system, to do a better job for our share-owners, which would also result in doing a better job for the public.

Competitors Full Grown

Our competitors are no longer infant industries that need nursing. They have long since been weaned and grown to maturity. We recognize that there is only one way to provide public highways, waterways and airways, and that one way is with public monies.

Is it not proper then, that commercial users of transportation facilities

provided with public monies, pay user charges adequate—but no greater than is necessary—to cover the use of those facilities and relieve taxpayers, including the railroads, from assuming that burden? A simple rule is that the user of any form of transportation should pay the full cost of whatever form he elects to use.

The railroads, out of each revenue dollar, pay out 23 cents to cover the cost of owning, maintaining and paying taxes on their rights-of-way. The truckers pay out of every dollar of revenue only four cents for taxes, other than federal income taxes.

An explanation for the prevailing state of mind toward the railroads as an investment may be found in a habit which we might call "depression thinking." This habit causes people to think of the railroads not as they are not as they will be, but rather as they were during the depression of the '30s. To associate the railroads with depression is not valid. The likelihood of a general depression similar to that of the '30s—which of course would affect the railroads along with all other industry—is very slim indeed. Of

WITHIN the investment community, as elsewhere, the problems of the railroads have been emphasized to such an extent that they have obscured the many positive aspects of our situation. That is why I chose as my subject "The Positive Side of the Tracks."

Investor pessimism toward the rails shows itself in many ways. It probably shows most clearly in the underpricing of rail stocks and bonds on the securities markets.

There have been attempts to explain this negative attitude by saying that the railroads themselves usually paint a gloomy picture of their own prospects. This refers, of course, to statements made by railroad officers in various rate cases,

insurance Company to undertake the great multi-block Lake Meadows apartment development, now under construction immediately east of Illinois Tech.

Last fall the Chicago College of Optometry moved into new headquarters across Michigan Avenue from the Illinois Tech campus. It has completed one of several new buildings it is constructing. Another school, the Vandercook School of Music, moved from Chicago's west side into the same block last summer. There are now relatively few blocks within the neighborhood that are not being rebuilt, or for which such plans are not now in the making.

Tech's postwar campus is spreading over 22 city blocks bounded on the south by 35th Street, on the north by 30th Street, on the east by Michigan Avenue, and on the west by Federal Street.

Progress Shows

Development of the campus has been accelerated in the past two years to the point that the current visitor no longer has to use his imagination to visualize the outcome. Crumbling mansions which had been converted into multiple dwellings and other run-down buildings that crowded wall-to-wall over most of the available land, have been vanishing at the rate of one per week. Where new, shiny steel and glass buildings

have not been built, there are open spaces, trees, shrubbery and grass.

Currently, Tech is in the middle of a fund-raising campaign to finance construction of a new building for its Institute of Design, its department of architecture, and a new department of urban and regional planning. The building will be the nineteenth modern structure erected on the enlarged campus since 1946.

Construction of this newest building will be underway in time for its use next fall. Two more new IIT buildings are now on the drawing boards, and they are planned for completion by the fall of 1956. One will be an electrical engineering research building under which will be buried the first nuclear reactor ever built for strictly industrial research use. The other will be a classroom building that will memorialize the founder of Lewis Institute.

Since the 1940 merger, Tech's assets have grown from about \$6 million to more than \$27 million. The current enrollment is nearly 2,000 full-time day students and more than 4,500 others in evening classes. For more than five years, Tech has been enrolling more engineering students than any other school in the United States. A privately supported co-educational institution, Tech also has both graduate and undergraduate courses in the sciences, humanities, and arts.

Architectural Forum magazine edi-

torialized last year: "Illinois Institute of Technology is growing to be the best architectural expression of a technological college in the world . . . perhaps it is the only really consistent one." The school's new buildings are of a consistent steel and glass, horizontal-line design. All of them, and the carefully plotted grounds out of the campus, have been designed by Mies van der Rohe, the noted architect who heads the school's department of architecture. To date, they have cost slightly less than an average of \$10 per square foot to build, less than half of the expense required for the familiar monumental structures found on many college campuses.

Completion Estimates

An Institute official estimates that completion of the campus plan can be achieved at an expenditure of about \$20 million and within ten to 15 years. Approximately 20 more buildings must be erected to replace the six original Armour Tech buildings that are still being used, and other old or temporary structures that are scheduled for demolition as quickly as IIT can accumulate the necessary funds. Progress is expected to be stepped up in future years because in the early stages of the campus redevelopment the Institute's first spare funds have had to

(Continued on page 25)



A unique view of the Lake Meadows apartment development



A General Electric innovation is a wall refrigerator-food freezer combination



An "up-side-down" refrigerator-freezer combination by Admiral Corporation

DESIGN For Better Living, Added Sales

By DAVE CHAPMAN

IN asking the question "Where is the appliance industry going?" one can hardly take a short-sighted view toward new lines of merchandise for 1955 or 1956. If you want to plan intelligently for the years immediately ahead, you had better have a good idea of where you want to be in 1960 or 1967.

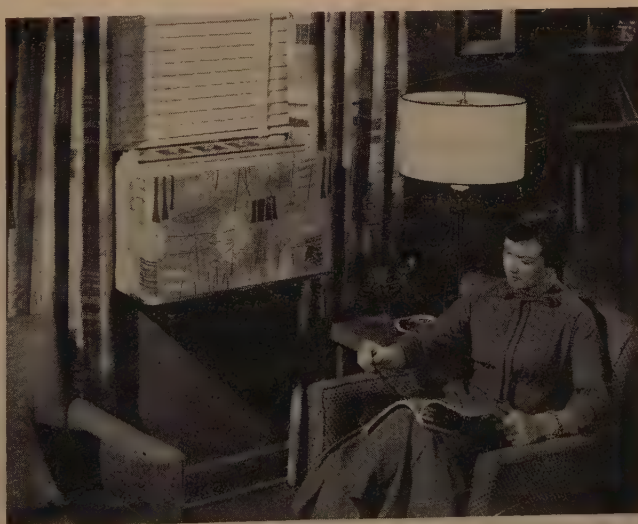
We can hardly know in what direction we are going unless we know where we have been and where we are today. Just a few figures drawn from surveys of the appliance industry made early this year will make the point. In the field of washers we have

achieved a 78 per cent saturation of the market. We have reached a 90 per cent saturation point in the market for refrigerators, 98 per cent in radio. Even in the most optimistic interpretation these figures point out that there is the unpleasant choice

of waiting for today's well-built goods to wear out before there is a new buyer, or of producing something so demonstrably better as to justify the homemaker's disposing of an appliance for the sake of buying something better.

And here we arrive at the heart of the matter. Through years of development both functional and structural qualities of appliances have been used as major sales points. Home appliances and equipment have been built so well that they will function effectively and stand up under hard usage for many years. In addition an excellent merchandising job has been done.

Now there are two choices. New markets can be made by creating



The trend to blend appliances with interior decoration and color demonstrated with an International Harvester air condition unit

The author is head of his own firm of industrial designers. This article is a condensation of his address before the national convention of the Institute of Appliance Manufacturers.

amounted to 1,629,000 hours, off 13.4 per cent from 1951, whereas business flying was up 6 per cent.

Total time logged by business or executive aircraft in 1952 exceeded that of all U. S. domestic airlines combined. Some idea of the size of the corporate fleet of U. S. industry may be gained from the fact that the oil industry alone operates more planes than all of the scheduled domestic, international, territorial and local service airlines of the United States put together.

Mostly Business

Between 75 and 80 per cent of all traffic at Meigs is business traffic. A breakdown of landings in August by type of aircraft revealed that 1,613 were by company-owned planes, 423 pleasure, 61 military and 12 charter. August was a record month with 4,568 plane arrivals and departures. Previous high was 4,218 in September, 1952.

Further evidence of the high percentage of business flying Meigs attracts is the perceptible drop in ac-

tivity at the airport on holidays and week-ends when business offices are closed.

The register at Meigs reads like a Blue Book of American industry. General Motors, Eastman Kodak Company, Monsanto Chemical Company, National Distillers Products Corporation, Radio Corporation of America, Procter and Gamble Company, Johns-Manville Corporation, Chase National Bank, Firestone Tire and Rubber Company and Continental Can Company illustrate the variety of commercial enterprises which have taken to the air. They are but a few of the companies, selected at random from a long list, owning planes which come into Meigs.

Among Chicago firms whose aircraft discharge and pick-up executive personnel at the field are Fairbanks, Morse and Company, Crane Company, Peabody Coal Company, Kraft Foods, and International Harvester Company.

Merrill C. Meigs, vice president of the Hearst Corporation and chairman of the Chicago Aero Commis-

sion, for whom the field was named, is among Chicago business executives flying their own craft who regularly use the port for business trips.

John Carr, superintendent at Meigs, describes the lake front airport as similar to a downtown parking lot, both in the convenience it offers and the business it draws to the Loop area.

Relieves Midway

Meigs performs another function in relieving Midway Airport of some of the private aircraft that otherwise would land there. Meigs is preferred due to its more convenient location despite landing and parking fees. Private planes may land at Midway at no charge. Tie-down also is free. Nor is there a landing or parking fee at any of the other airports in the Chicago area.

Meigs charges a minimum landing fee of \$1.00. Planes with a licensed gross weight of more than 5,000 pounds are assessed an additional 20 cents for each additional 1,000 pounds or fraction thereof. Parking

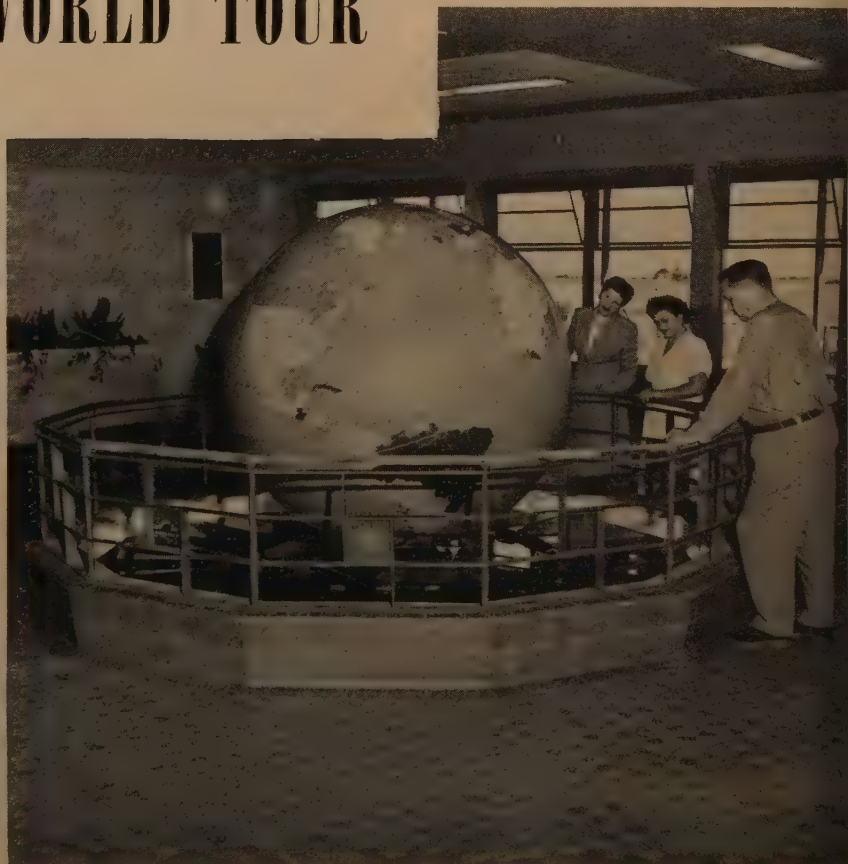
FOUR MINUTE WORLD TOUR

Perhaps with the thought that looking at it will whet the appetite for travel, the new municipal airport at Cedar Rapids, Iowa, has installed this giant custom-built globe in the lobby of its administration building.

Six feet in diameter, the globe is powered by an electric mechanism that rotates it on its axis every four minutes simulating the earth's actual 24-hour rotation. The sphere is made of sheet aluminum that is one-eighth of an inch thick and has no interior bracing. It contains 113 square feet of surface area.

According to Dyna-Graphic Displays of Brooklyn, which spent six months constructing it, the globe is true to one thirty-second of an inch or accurate enough so that it could be used to calculate intricate navigation problems.

Geographical details were transferred from flat surface maps to the curved surface of the sphere by mathematical projection.



ees are \$1.00 for four hours, \$1.50 for eight and \$2.00 for 24 hours. That's less than it costs to park a car in some downtown parking lots today.

The fees, according to Mr. Carr, were inaugurated less for revenue than to enable the city to exert a "semi-official" control over traffic. To the degree possible, the landing fees are intended to discourage the inexperienced or unskilled pilot from using the field. Landing can be tricky at Meigs due to the type air currents encountered on the lake front.

No Fatalities

While there have been no fatalities at Meigs, there have been accidents, mostly to light planes. Ninety per cent have been due in whole or in part to inexperience or inability of the pilot to handle downwind and crosswind components in landing. Normally a plane lands and takes off into the wind but this is not possible a considerable number of days at Meigs.

Regulations placed in effect in April, limiting traffic for the first time under certain wind conditions, have cut the accident rate 62½ per cent in the eight months through November compared with the same period last year. They are aimed primarily at light aircraft. Most executive aircraft is of a heavier class and is operated by highly proficient pilots, many with an air transport rating. An occasional DC-3 and C-46 may be seen putting down at Meigs and parked on the lake front alongside Bonanzas, Beech, Aero Commanders and the like, which predominate.

Under the new rules, planes weighing 1,500 pounds or less are prohibited from landing when winds are 90 degrees to the runway with a velocity of 15 miles an hour. No single engine aircraft, unless equipped with tricycle or caster gear, may land when winds are 90 degrees to the runway with a velocity of 20 miles an hour or gusts are above 20 miles an hour. When winds are 90 degrees to the runway with a velocity of 25 miles an hour, the field is closed to all aircraft.

Many improvements have been made by the city since the field opened five years ago. Then known

as Northerly Island Airport, it was placed in operation with only a wind tee to aid pilots landing there. Meigs now has a radio tower and is being readied for night operation beginning next April. Runway lights already are in. Floodlights for the parking area and apron are being installed. Also in process of installation is new radio equipment to replace initial second hand equipment, bought, scrounged and borrowed to get the tower in operation in time for the 1952 Republican and Democratic national conventions in Chicago. The tower building includes a garage for ground service vehicles and offices for airport supervisory personnel, formerly housed in the terminal building.

Parking areas have all been resurfaced. The loading and ramp area has been extended, black topped and hard surfaced. A baffle wall, about 15 feet in from the protecting steel bulkhead out in the lake, is nearing completion. It will help break the force of the waves on days when Lake Michigan goes rampant and prevent debris from being washed up on the south end of the runway. North, the 2800-foot runway extends toward the esplanade of the Planetarium.

Limited Night Operation

Only limited night operation is planned at the start with the field probably remaining open from sunrise to midnight. How quickly Meigs goes into eventual 24-hour operation depends on traffic and whether the additional operating expense entailed can be justified. Downtown shops, department stores, theaters, restaurants—all are expected to benefit. Business men, visitors and others flying in for the day will be able to spend more hours in the city without fear of being unable to take off after sunset.

With the field equipped for planes to take off and land after dark, traffic during the winter months should be helped considerably when, due to the shorter day, traffic drops sharply as operation of the field is curtailed.

In any event, Meigs can look forward to increased activity. The forecast is that the nation's present business aircraft fleet will double in the next two years. Meigs is prepared to meet that growth.



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Sound That Can't Be Heard

(Continued from page 15)

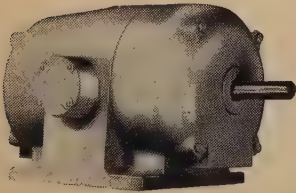
— LIGHTWEIGHT —

ELECTRA MOTORS

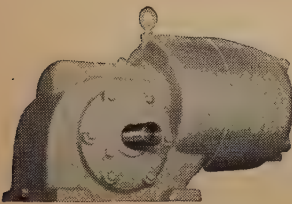
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vibrations up to 20,000 cycles per second. Scientists have been able to produce sounds as high as 500 million cycles per second.

One of the best teachers the scientists have had in this new field has been the bat. For centuries people wondered why the bat, with his notoriously poor eyesight, could fly about at top speed without bumping into things. He does it by constantly emitting little squeaks that range in frequency from 25,000 to 70,000 cycles per second, listening to the echo of the sound waves as they bounce back from a tree or building. By this means he is able to get a pretty good picture of his surroundings.

Once the secret of the bat's uncanny ability was out, it was a short step to one of the earliest applications of ultrasonics, the detection of submarines under water. High frequency sound waves were produced, under water, and the location of the submarine was determined by the echo returned from its hull. Sound travels much faster through water, incidentally, than it does through air.

The favorite method of scientists in producing ultrasonic waves is to use electrical energy as the basis of power. This is known as the piezoelectrical method, in which an electrical charge is developed on a quartz

or similar crystal. Quartz crystals vibrate at a high frequency when a voltage is applied across them, and ultrasonic waves are generated. The frequency of the waves generated varies with the crystal thickness. A transducer converts the electrical power of the high frequency signal into vibratory energy in the form of high frequency sound waves.

Cost Saver

Until recently it has been the small size, high cost, and fragile nature of the crystals that has been the big barrier to full scale use of ultrasonics. Scientists considered it virtually impossible to make transducers, or power generating equipment, large enough for production of sound wave energy on a practicable scale. Now they pin their hopes on a new ceramic material which can be made into relatively large sizes, and can be polarized so that it reacts to the application of electrical energy like the quartz crystal.

To date, one of the most practical applications of ultrasonics is for cleaning small tools and razor blades. At the Schick Plant at Stamford, Connecticut, high frequency sound waves are used to clean electric shaver heads. Previously Schick



"What, another raise — didn't I just refuse you last month?"

Cleaned shaver heads with the use of alkaline solvents, agitation washing machines, and manual brushing. Now, with ultrasonics, the high pitched sound waves directed through a liquid solvent, remove metal particles, oil and grease from the tiny openings and corners of the shaver heads, and the cost of this operation has been cut 58 per cent.

Since sound generators currently available do not have sufficient output intensities to send energy impulses through large areas, the tanks or containers now used for ultrasonic cleaning are relatively small. But what they lack in size they make up in speed. Schick's cleaner can completely degrease a load (10 to 50 parts) in only 60 seconds. Its level of productivity is estimated to be superior to that of a 30 gallon cleaning tank.

Drilling and Boring Use

Another successful application of ultrasonics is in the drilling, boring, and cutting of hard brittle materials. This is accomplished by a device called the Cavitron. The Cavitron uses a combination of light pressure, abrasive particles, and ultrasonic vibration to perform its work. Its principle is basically that of greatly speeding up wearing of the material being machined. The basic cutting tool of the Cavitron is made of soft steel, in the shape of the form to be cut, and held in the small end of a metallic cone. All motion of the tool originates in this cone and is caused by ultrasonic frequencies vibrating at 27,000 times a second. As the tool vibrates, boron carbide, an economical abrasive compound, is poured onto the contact area. The tool drops head-on onto the material to be cut, and drives the abrasive particles into it. All of this, of course, occurs quite rapidly. The Cavitron can push a pen point through a piece of plate glass in 2 minutes without splintering the surrounding area. It can drill holes through diamonds, and works easily with such difficult to machine materials as tungsten carbide and ceramics. The Cavitron's contribution to American industry lies in its ability to carve intricate shapes in heretofore brittle and difficult to work with materials. Not unappreciated either, by its users, is the fact that the operation of the Cavitron does not require highly skilled personnel.

Less successful is ultrasonics' performance in testing castings or forgings for internal flaws, and in determining thicknesses of metals. Like x-ray testing, defects can be spotted by observing the difference in behavior of the waves directed through the main piece under test and those passing through flaws or holes. The biggest stumbling block in this application is the fact that it depends too greatly upon the instrument operator and there is too much room for variance in the interpretation of the results of the tests. To be more specific, ultrasonic test methods depend upon proper contact of the transducer, or quartz crystal holder, with the material being tested. On a forged, rolled or ground surface, the necessary intimate contact between the material being tested and the ultrasonic unit is obtained and the results are excellent. But a rough surface, or a concave surface, is not so good. Here a pronounced scattering of the sound beam occurs, and the test is often not reliable unless performed by a highly experienced and skilled operator.

Another stumbling block is the great increase in "thinning" which accompanies increased frequency. A doubling of sound frequency will result in a four-fold increase in loss of sound power for a given distance. To put it in the words of the laboratory scientists, "thinning increases roughly as the square of frequency."

Silent sound has made a few steps out of the laboratory and into industry, and its contributions in these instances have been considerable. But about that business of ultrasonics cooking food in your home, killing flies, and preserving food—that's something else again. Ask a laboratory worker where the next advance is likely to be in putting ultrasonics to work in your home, and he very likely will limit his prediction to the laundering of clothes, and decline to predict a date on that.

600,000 Motions A Second

Professor Ernest B. Yeager, Director of Western Reserve University's Ultrasonic Research Laboratory in Cleveland, says electrically controlled sound waves can agitate the week's wash 600,000 times a second, and thoroughly remove dirt from clothes. But here again considerable research is needed. A frequency that would clean linen clothes might rip silk to shreds.

In spite of the many advances ultrasonics has made, a big difficulty in the practical application of silent sound is still the cost of the power generating equipment. The cost of producing the inaudible sound waves is prohibitive for most applications. As to the sirens and whistles mentioned earlier, the trouble with them is that the desired intensity cannot be perfectly controlled. Nor are they

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capable of producing frequencies much beyond the audible range.

But there are other obstacles to be overcome. Sound waves so "hot" they can cook food can, of course, inflict severe burns. Workers with ultrasonics note that they become heavily fatigued and often nauseated. Even in the laboratory, ultrasonics workers move cautiously with their

new tool. They often wear ear plugs to avoid shattering their ear drums.

Ultra-sound was a laboratory curiosity even before 1900. Now, some 50 years later, it is still in the experimental stage, posing maddening unsolved problems to the scientists. They don't know how soon its great potential will be realized. They don't know why it behaves the way it does.

Improving Mail Deliveries

(Continued from page 13)

be delivered in Chicago the next morning.

One of the Summerfield team most deeply involved in the effort to provide better service at less cost is a Chicagoan, former traffic manager for Sears, Roebuck and Company — John C. Allen, Assistant Postmaster General in charge of transportation.

The Post Office is now paying about \$500 million a year for transporting the mail between cities. Some \$340 million of this is paid to the railroads, of which about \$80 million goes for the hauling of railway post offices — the cars in which clerks sort the mail en route to get it ready for distribution on arrival.

Sorting while traveling is a relatively expensive task. It costs 48 cents per ton mile in an RPO for the transportation, not counting such other costs as terminal handling and away-from-home expenses for the clerks. The CAB-approved rate for hauling mail by air between Chicago and Washington is 20.04 cents per ton mile. The speed of transportation permits the sorting to be done at lower cost on the ground.

Rail Office Costs

The high cost of RPOs was one of the first areas of possible economy that caught the eye of the incoming Post Office administration. The Post Office had turned to highway post offices — mail sorting cars on busses — some years ago, because of reductions in railroad mileage and dropping of spur lines due to truck and private car competition. The department had learned something of the economy of the HPO compared with the RPO, but had not made full use of its potential.

The ton-mile figure for govern-

ment-operated HPOs currently is approximately 34 cents a mile. The new administration noted that since 1949, however, the cost has gone up — from 24½ cents — while the cost of the same service performed under private contract advanced only from 27 to 28 cents.

Trucks Make Saving

By last June 30 the Post Office was operating 368 truck routes for sorting mail en route at an annual rate of \$6,600,000. This had replaced railway service which had cost \$17,900,000, or two and a half times as much. Since then additional truck routes and shifting to private contracts have made possible further savings of approximately \$8,000,000 a year. The HPO, originally used for hauls of about 300 miles, is showing promise of being good for 500 miles.

The RPO, except for longer hauls, is almost priced out of the business. It will always serve some function in mail distribution, but what the railroads lose in reduction of that service they stand to make up in another form. Allen believes there are big opportunities for additional savings in transportation of mail by freight.

The passenger trains to which mail cars are attached are scheduled to arrive in major cities at hours suiting the passengers' convenience. Usually this is not the most efficient time for mail arrival. While the passenger gets a chance to sleep until a normal morning hour, the mail misses out on the pre-dawn sorting that would enable morning delivery, and thus sometimes has to wait 24 hours before reaching the addressee.

On the other hand, mail is often dispatched in less than carload lots

in the theory that it must be kept moving. Allen thinks it could be accumulated during several hours of business day for cheaper carload shipment and still encounter no delay in actual delivery.

Surface mail from the west coast to the east coast can be hauled by the carload more than half the distance—for example, to Omaha or Council Bluffs—before the sorting process must begin to fan out to the Atlantic seaboard cities. Potatoes move by fast freight. Why not the United States mails?

One of the big experiments of the new postal administration is moving parcel post and mail by freight. The economy possibilities include:

Loading whole trailers and running them on to railroad flat cars for distance hauls, a system known to shippers as the "piggy back" operation. Employed on the New York to Boston run, for example, this would avoid the job of trucking over congested highway routes or the expense of railway mail car spaces.

Unit Loading Trial

Use of containers designed to fit a certain number of units into a freight car space, permitting smaller towns along the route to be serviced by dropping off of unit containers. Allen watched one experimental container-loading of a freight car which took only eight minutes and put 20 per cent more mail on the car than possible under the old loading system.

Mechanization of container handling at terminals.

Other experiments are being conducted in the use of helicopters for local transportation of mail in three large cities serving a total of 81 post office communities. Chicago is one of the cities taking part in this study, which seeks to cut costs of hauling mail from post office to airport, and between the suburban offices. The department also is making a survey of its antiquated "star route" delivery system with the hope that consolidation of contracts can be accomplished to conform with changing conditions.

Summerfield has adopted an ambitious goal for the economy drive in his department. On taking office he inherited an estimated deficit for the current fiscal year of \$746 mil-

lion. He wants to cut it to \$74 million by next June 30.

In the overall Eisenhower revision of the 1954 government budget the Post Office contributed a \$152 million reduction of its deficit. Its subsequent increases in fourth class, parcel post, and catalog mail rates and foreign postage charges cut the deficit another \$200 million.

Further tax savings depend on Summerfield's success in persuading Congress to shift the burden from the general taxpayer to the mail user. He wants to increase first class mail to four cents for the first ounce, domestic air mail by one cent an ounce, and to raise various other rates for second and third class mail.

Congress created low rates for second and third and fourth class mail on the principle that all the people benefited from the dissemination of information made possible through books, newspapers, and magazines. While some increases may be voted, Congress is still inclined to the view that this is the kind of public service that justifies some subsidy through a postal deficit.

Aside from such considerations, it is heartening to know that in one familiar branch of the government service, which touches everyone, the business-management economy ideas of the new administration are beginning to pay off.

The Positive Side of The Tracks

(Continued from page 20)

long their life actually started over forty years ago, but experience and constant research have developed improved methods of treatment so that the average service life of ties has been tripled.

Probably the most impressive of all developments affecting the railroads' foundation—their track—is the revolution that has taken place in maintenance methods. We are doing the bulk of track maintenance today with machines—faster, better and at less cost per unit of work performed. In multiple track terri-

tory we turn over a portion of track for an eight hour period on a working day to our maintenance forces for their exclusive use, and they line up a battery of machines on an assembly line basis to perform all of the operations that were formerly done by laborious and costly human brawn, from pulling and driving spikes to cleaning and tamping ballast.

In the field of signalling, C.T.C.—Centralized Traffic Control—has been a subject of much interest to your analysts. There have been other

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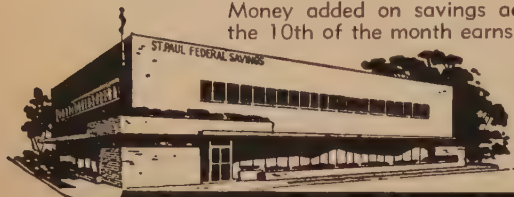
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technical graduates than in 1954. Average starting salary in all fields, including sales and general business training, will be \$341 a month, \$6 higher than last year. Beginning engineers will be offered an average of \$361 a month and graduating accountants \$332 a month.

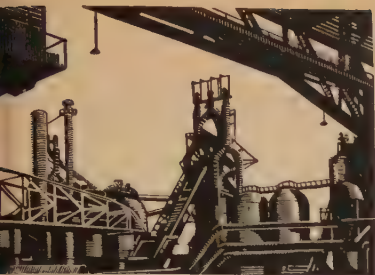
The graduate hired five years ago who has made average progress has almost doubled his starting salary, the survey reports. He started at \$255 a month and now is earning \$508. In the field of sales, average salaries have risen from \$254 to \$547 a month. The 1949 graduates chosen by their companies as the outstanding men hired in that year have increased their starting salaries by 240 per cent and now are earning an average of \$639 a month.

Not one of these top employees had below average scholarship records, according to Dr. Endicott. The large majority of them had above average or very high grades in college. Characteristics which made these men outstanding were listed by their employers in this order: ability to work with people, ability to get things done, good mental ability, and initiative.

The survey showed also that the majority of business executives today are college graduates. Some 74 per cent of the presidents of 126 companies reporting had earned college degrees. About 73 per cent of the 1,211 vice presidents in 123 companies were college graduates, as were two-thirds of employees who report to vice presidents.

• *The Female: Urban vs Suburban* — The city gal takes more responsibility and makes more money than her suburban counterpart the Chicago Community Inventory report shows. The median, personal income for the Chicago female was \$1,764 and \$1,474 for the Suburbanite. The Chicago female is head of the house in 11 per cent of the homes but only about seven per cent of suburban households are headed by a female.

More suburban females have husbands than the city females. For females residing in Chicago, 60 per cent were married and three per cent were separated, while in the suburbs, 67 per cent of the females were married and one per cent separated.



Industrial Developments

... in the Chicago Area

INVESTMENTS in new construction, expansion of existing plants and the purchase of land and buildings for industrial purposes totaled \$16,932,000 in December, bringing the total investments for 1954 to \$231,683,000. These figures compare with \$16,022,000 in December, 1953, and \$141,902,000 for the year.

Universal Atlas Cement Company, subsidiary of U. S. Steel Corporation, with its principal plant located at Buffington Harbor, Ind., will construct a new producing unit adjacent to its present plant which will have a capacity of more than three million barrels of cement annually. The combined facilities of the present plant and the new unit will total more than 10 million barrels a year.

Sinclair Refining Company is making some large scale additions to its fluid catalytic cracking unit in East Chicago, Ind.

Calumet Industrial District Company is completing construction of the first 250,000 square foot unit at its multimillion dollar food distribution center on the west side of Stony Island avenue at 95th street. The second unit is well underway, and will be ready for occupancy in the spring. The Kroger Company has leased, and will operate, 90,000 square feet of the first unit, the balance being operated by Calumet Industrial District Company itself. The large warehouse is served by the Chicago, Rock Island, & Pacific Railroad, with cooperation on switching from the Nickel Plate Railroad. This will be one of the largest operations of its kind in the country when all 12 units which are planned are completed.

F. B. Redington and Company, 112 S. Sangamon street, will erect a new plant at 3000 St. Charles road,

Bellwood, where it will relocate when the construction is completed. The plant will cover an area of 60,000 square feet. The company manufactures cartoning, packaging, wrapping, and labeling machinery. Albert E. Ersimon Jr., architect.

Waylite Company, a subsidiary of Interlake Iron Corporation, has established a plant at 108th Street and the Calumet River. The company makes a light weight construction aggregate out of slag.

Dudek and Bock Spring Manufacturing Company is erecting a new building to house its manufacturing and office facilities at 4016 W. Grand avenue. The building will contain 40,000 square feet and should be completed in January. The company makes springs, wire forms, metal stampings, and butt welding. A. E. Strobel, architect.

Production Finishers, Inc., 526 W. 18th street, is erecting a new factory building at 4430 W. 14th street where it will relocate its japanning works when the construction is completed. The building will contain 20,000 square feet of floor area.

Algonquin Tool and Manufacturing Company, 4820-22 W. Flournoy street, is erecting an addition of 14,000 square feet to its plant which will be used as storage space. William F. Goulding, architect.

Ideal Tool and Manufacturing Company, Inc., 5825 S. Western avenue, will relocate in a new plant now under construction at 5615-57 S. Claremont avenue. The new building will contain a floor area of 25,000 square feet. The company makes special machinery, tools, dies, fixtures.

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company will carry on research operations with filtration systems in the plant in addition to other manufacturing operations. The firm's midwestern sales office will also be located in the new structure.

• **Kentile, Inc.**, 4532 S. Kolin street, is making a top addition to its factory building No. 5, which will contain 18,000 square feet of floor area. A. Epstein and Sons Inc., engineer.

• **W. J. Dennis and Company**, 4444 W. Irving Park road, has completed construction of a branch factory in Franklin Park. The company manufactures weather stripping and other hardware specialties.

• **Seng Company**, 1450 N. Dayton street, is adding 10,000 square feet of floor area to its plant. The company produces mechanical devices and steel equipment for furniture manufacturers.

• **Permo, Inc.**, 6415 N. Ravenswood avenue, manufacturer of phonograph needles and aircraft instrument parts, is making an addition of 13,000 square feet of floor area to its plant.

• **Weigel-Miller, Inc.**, 3539 Lincoln avenue, producer of wood finishing supplies, is erecting a 6,000 square foot building in the Addison Industrial District north of Norwood avenue on Interstate road.

• **Chicago Tramrail Corporation**, 4000 W. Washington street, has purchased property at the corner of Kostner and 14th on which it will construct a plant.

• **Arrow Leather Goods Manufacturing Company**, 1439 S. Halsted street, has purchased the two-story building at the northeast corner of Oakley and Walnut streets. The building contains 19,000 square feet of floor area. J. J. Harrington and Company, broker.

• **Hales and Hunter Company**, 4600 W. Cortland street, feed manufacturer, is expanding its laboratory.

• **Triumph Manufacturing Company**, 913 W. Van Buren street, electronics manufacturer, has acquired a 7,000 square foot building in Schiller Park. J. J. Harrington and Company, broker.

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Rx For Accident Prevention

(Continued from page 18)

Caterpillar's medical director, Dr. Vonachen. "Industry, by hiring these individuals, will not only do the community a great service, but also will be able to get valuable, trained employes. An additional advantage is that, as with all handicapped employes, the turnover rate of the 'ex-san' patient is much lower."

Employing Handicapped

When Dr. Vonachen talks about the work performance of handicapped employes, he knows what he is talking about. Caterpillar at present employs about 2,200 of them, out of a total payroll of 23,000. The group includes amputee spray painters, office clerks with heart trouble, and a completely blind worker who repairs safety glasses.

At Chrysler Corporation the job-placement physical idea took root in 1943. Since then more than 185,000 physically handicapped persons have been hired. "Ordinarily, these work-

ers would be rejected for employment by industry," according to Medical Administrator Harry Burr.

It is clear from these figures that although much remains to be done, industry has gone a long way toward alleviating the problem of the nation's physically handicapped workers. The emotionally handicapped worker is another story.

"Today, only a comparative handful of firms are doing anything about the emotional and mental parts of the 'total man' who comes to them looking for work," according to Dr. Vonachen.

The mental hygiene section of the East Peoria plant's medical department is staffed by five graduate psychologists who test all new workers and counsel many of them. Regular employes with personal emotional problems come in also, and a surprisingly high percentage of the difficulties are straightened out. Before a Caterpillar employe is promoted

usually visits the mental hygiene section.

In 1952 the Caterpillar psychologists gave about 65,000 tests. A large number of those who took the tests were job applicants. Each prospective employee receives two types of psychological exam. It is significant that, on the basis of their ratings on these mental and emotional tests, at least 25 percent were rejected. On the other hand, included in the number added to the payroll were several borderline cases who were found fit for jobs after post-test consultation.

The mental hygiene section uses a battery of about 90 psychological tests. Many of these are given to prospective employees being considered for engineering, sales, and other specialized jobs. Other tests include one which measures temperament and another which is typical — determine whether a worker is ready for advancement.

Mental Hygiene Success

The most fascinating phase of the mental hygiene section's work involves the maladjusted employee. Many tests and many consultations are required to get these workers on the right track again. But, the fact that all this time and effort pays off in terms of a happier worker who does a better job is indicated by countless cases from the psychologist's files. Here is a typical example:

We'll call the patient "Matt." At the time he was referred to the mental hygiene section, Matt was married, 28, and the father of two children. He'd been with Caterpillar two and a half years, employed as a turret lathe operator.

Matt didn't like working in the shop. He complained that the environment gave him "dizzy spells," that it made him sick to his stomach. He wanted a transfer. Matt added that he was worried because his wife was too lax with the children. He also complained that local physicians laughed at his dizzy spells.

Matt was an ex-GI who had received an honorable discharge. A check with the Veterans Administration revealed that he had fainting spells while in military service. Upon discharge, he had been granted 30 percent disability for his malady. He had been hospitalized twice by the VA after becoming a civilian.

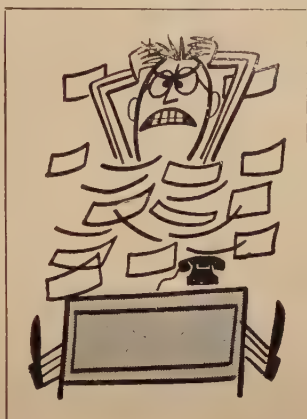
During the next year, Matt visited

the mental hygiene section at the plant 18 times. He also received help from VA and the Peoria mental hygiene institute. While he was undergoing these treatments, Matt suffered several unhappy experiences. His daughter was found to be mentally retarded and was taken out of school; there was an affair between his wife and another man, and Matt was involved in an uninsured automobile accident for which he was held liable.

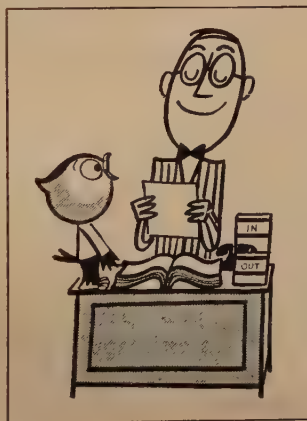
"But in spite of these shocks, Matt improved gradually during his treatment and especially during the last

four months," one of the plant psychologists explained. "Matt found, through discussion, more satisfying modes of behavior and obtained insight into some of his personal needs. He learned how these needs were related to his symptoms."

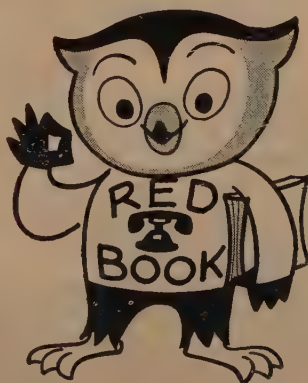
Matt's job wasn't changed. It wasn't necessary, for at the end of the treatment, Matt's foreman reported: "He has the highest production of all the men doing like work. He wants to do a better job. He gets along well with fellow employees, and has good safety and attendance records."



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(Continued from page 8)



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year since to 1,022 in 1953. Out to combat the trend is the two-year-old Bank-Share Owners Advisory League, a 500-member bank group. The League will hold a three-day seminar in Chicago starting January 21. J. Ross Humphreys, president of the Central National Bank of Chicago, is league president.

• **Are We Really Saving?** — The Commerce Department has come up with the heartening statement that Americans put 6 per cent of their 1953 income into savings. Then comes the Home Loan Bank Board saying that "long-term" personal savings of the public crossed the \$200-billion mark last year. This comes to about \$4,300 per family, or almost enough to meet a year's expenses. But—in 1945 the average family had put away \$3,600, which represented more producing power at that time than \$4,300 does today. Despite our thrift, are we losing ground?

• **Scanning Machine** — Scientists at Battelle Institute in Columbus are working on the development of electronic machines that they hope will be able to scan up to five million published documents an hour and identify those relating to a prescribed information need. President Clyde Williams says that the machine would be a "moronic robot" lacking the ability to understand. With current publication of technical information estimated at 60 million pages annually, the machine could help tremendously in cutting down the time required to complete research projects. The key to maximum effectiveness lies in the development of a new system for translating information into symbols appropriate for machine use, Williams declares.

• **Can You Match This?** — Nearly 260,000 U. S. firms gave away 12.5 billion books of matches in 1953, costing a record \$27,000,000. According to the Match Industry Information Bureau, 500 billion matches were used during the year, about half of which were book matches. The 500 billion total represents 3,333 matches per capita, a figure

that is surpassed slightly by per capita cigarette consumption. One out of every 15 of the country's business establishments put its message on match books, and nine out of ten books were distributed free. Because of the give-away habit, the average American spent only 31 cents for matches last year.

• **What Is Coincidence?** — What do we mean when we say that certain events happened simultaneously? Did they happen in the same second or same hundredth of a second? Most of us don't have reason to be too particular, but physicists working with the University of Chicago's 450-million-volt synchrocyclotron (atom smasher) can pin down simultaneity to events that happen within one-hundred-millionths of a second. Under the best conditions they can study events as little as one-billionth of a second apart.

• **Aluminum Cans** — The technical magazine, Chemical and Engineering News, reports that aluminum fabricators now are planning a campaign to introduce aluminum containers into the food packaging field as the metal becomes more and more readily available. Aluminum cans, says the magazine, are already being used in quantity in Scandinavia for packing fish, while similar cans have been used in Switzerland for milk products. For packaging preserves and dry food products, it adds, boxes of cardboard sides lined with lacquered aluminum foil and top and bottom of sheet aluminum have also been used.

• **Wanted: Engineers** — The United States faces a critical shortage of engineers. Industry needs 30,000 a year for many years to come, according to the Engineering Manpower Commission of the Engineers' Joint Council, but it will get only 16,200 in 1953. What's more, there are 40,000 jobs waiting to be filled in the engineering profession right now. Reserve Officers Training Corps and the draft are draining off 6,800 new engineering graduates a year. The EMC's answer is a campaign to urge teenage boys and girls to consider careers in engineering.

Transportation and Traffic



PURCHASE of the government-owned Inland Waterways Corporation, operators of the Federal Barge Lines, by a private interest, has been approved by the Interstate Commerce Commission. Secretary of Commerce Sinclair Weeks, on July 14, 1953, announced that the government had entered into a contract with the Federal Barge Lines, Inc., a Delaware corporation, for the purchase by the latter of the real and personal property of Inland Waterways Corporation for \$9 million. The sales agreement required (1) adequate provision for transporting less carload and less bargeload shipments and the active solicitation of such shipments; (2) maintenance of joint rates with rail carriers; (3) arrangements for interline traffic with other transportation services; and (4) transportation service in designated districts and divisions with specified minimum trips. In approving the purchase the commission said: "The obsolete and rundown equipment now operated by Inland will be rehabilitated and a high standard of service along Inland's routes is expected to be maintained. The government will be relieved of the continuing deficit spending for repairs and improvements to the properties of Inland. Service to the public will be continued, and because of the proposed sale, will be improved without any anticipated adverse effect upon the existing private carriers who presently compete with Inland." The commission will issue the purchaser a common carrier certificate to supersede the temporary authority under which it has been operating since September 14, 1953.

I.C.C. Postpones Truck Leasing Rules Until March, 1955: The Interstate Commerce Commission, by an order in Ex Parte MC-43, Lease and Interchange of Vehicles by Motor

Carriers, postponed from March 1, 1954, to March 1, 1955, the provision of its order requiring that the use of non-owned motor vehicles by authorized carriers be under at least a 30-day written contract or lease. Also postponed to March 1, 1955, is that portion of the order which prohibits the payment of compensation for the use of leased vehicles on a basis of any division or percentage of the rate or rates or revenue earned on any commodity or commodities transported in the vehicle. The commission has also reopened the proceeding for further hearing with respect to both the 30-day leasing and the compensation provisions of the order.

Increased Postage Rates on Catalogs Effective February 1: The increased postage rates on catalogs and similar printed advertising matter, recently authorized by the Interstate Commerce Commission, will become effective February 1, 1954. The increased rates are as shown below:

Zone	First Pound (cents)	Additional Half-Pounds (cents)
Local	12	0.75
1 and 2	13	1.5
3	14	2.0
4	15	2.5
5	17	3.25
6	18	4.0
7	19	5.0
8	20	6.0

I.C.C. Sets Up Committee to Study Licensing Fees: E. F. Hamm, Jr., managing director of the Interstate Commerce Commission, has appointed the following as a committee to prepare proposed schedules of fees to be paid the commission for licensing and related activities: George W. Laird, secretary of the commission, chairman; F. E. Mullen, chief examiner; C. E. Boles, director, Bureau of Finance; W. Y. Blanning, director, Bureau of Motor Carriers; and C. G. Jensen, director,

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Bureau of Traffic. The committee must submit its schedule of proposed fees by January 8, 1954 and they will be announced by the commission on or before February 1, 1954. The Bureau of the Budget recently ordered all government agencies to submit cost studies or surveys to be used in determining fees for the processing of applications for and the issuance, renewal, modification, transfer or termination of any license, permit, certificate, charter, registration, exemption or similar form of authorization granted or otherwise provided by such agencies.

• **Motor Rate Adjustment to Southwest Suspended:** The Interstate Commerce Commission, by an order in I. & S. M-5450, Rates, Minimum Charges and Exceptions—Middlewest, suspended until June 16, 1954, a proposed adjustment in motor carrier rates applicable between Central and Illinois territories, on the one hand, and Southwestern territory, on the other. The suspended tariffs, published by the Middlewest Motor Freight Bureau to become effective November 17, 1953, proposed establishing the railroad Docket No. 28300 class rates, including the Ex Parte No. 175 increase, plus a further hike of 5 per cent on movements from or to points in Oklahoma and 15 per cent on movements from or to points in New Mexico, including El Paso, Texas. The organizations requesting the commission to suspend the adjustment included the National Industrial Traffic League, Illinois Territory Industrial Traffic League, Iowa Industrial Traffic League, and the state commerce commissions of Iowa, New Mexico and South Dakota.

• **Hearing in Railroad Mail Pay Case** January 6: Hearing in Docket No. 9200, Railway Mail Pay, will be held January 6, 1954, at Washington, D. C., before Interstate Commerce Commissioner Mitchell and Examiner Mullen. The commission reopened this proceeding for the purpose of considering the petition filed by the railroads requesting a 45 per cent increase in compensation for transporting the United States mail. The petition said that mail revenues for 1952 amounted to \$319 million and that the railroads' cost for handling the mail was about \$450 million. Based on 1952 reve-

nues, a 45 per cent increase in mail pay rates would yield about \$14 million additional revenue annually.

• **Motor Carrier Pick-Up and Delivery Charge Disapproved:** A proposal to assess a charge of 10 cents per 100 pounds for pick-up service and a like charge for delivery service on all motor carrier shipments moving between Central and Illinois territories, on the one hand, and Southeastern territory, on the other, has been stricken from the agenda of the Central and Southern Motor Freight Tariff Association. The proposal was opposed by the Chicago Association of Commerce and Industry.

• **New Illinois Motor Tariff Bureau Organized:** A notice from George S. Mullins, executive secretary of the Motor Carriers' Conference of Illinois, Inc., states that as of January 1, 1954, all of the tariffs of the Conference will be cancelled. A new bureau, the Illinois Intrastate Motor Carrier Rate and Tariff Bureau, Inc., has been organized for the purpose of publishing agency tariffs covering the entire state of Illinois, on intrastate traffic only. The action results from passage of the Illinois Motor Carrier of Property Act requiring motor carriers to file tariffs with the Illinois Commerce Commission by January 1, 1954.

• **Faricy Reelected President of A.A.R.:** William T. Faricy was reelected president of the Association of American Railroads at a meeting of the Association's board of directors held November 20 at Chicago. Mr. Faricy has been president of the A.A.R. since 1947. Other officers reelected include J. Carter Fort, vice president and general counsel; G. May, vice president in charge of the operations and maintenance departments; Phillip A. Hollar, vice president and assistant to the president; Robert S. Henry, vice president in charge of public relations; Arthur R. Seder, vice president in charge of accounting, taxation and valuation; J. Elmer Monroe, vice president and director of the Bureau of Railway Economics, and Walter J. Kelly, vice president in charge of the traffic department.

Suburbia vs. The City

(Continued from page 12)

been spent for capital improvement along State Street alone!

Further indication of the downtown retailer's viewpoint on suburban competition comes from Marshall Field and Company, which is currently planning shopping centers in suburban Skokie and Park Forest, respectively north and south of the Loop. The two projects mark the extension of a policy that began in 1929, when Field's opened stores in Evanston and Oak Park, each with about 100,000 feet of floor space.

Lytton's established branch stores in these same two communities in 1927.

"From the moment they were completed, these stores were busy and successful," observes Field Vice-President Sizer. Yet during construction they were referred to as "Field's folly."

The only folly, according to Sizer, was not building the stores large enough! To avoid making this same mistake in Skokie, Field's is providing for about 350,000 square feet of floor space in the gigantic new project. The Park Forest store, due for completion in early 1955, put Field's right in the middle of a thriving new community which has grown to 22,000 in the five years since it was founded.

Satellites Actually Help

Back in 1929, when the first Field's suburban stores were being built, pessimists feared that the downtown store's volume would suffer. On the contrary, business grew better and better, and Field's is now convinced that "satellite units seem . . . to add to the pull of the central store."

"Increased sales in outlying areas do not indicate a loss of volume on State Street," said Willard Cole, the President of Lytton's, in his last year's annual statement.

Out in Seattle, Field's had the choice of investing in a new suburban location or enlarging its Fredrick and Nelson Department Store. Field's chief Seattle competitor dominated a large new outlying shopping center, but regardless, Field's spent about \$10 million doubling the size of its downtown store.

"While it is too soon to chart

definite results, the early signs are that our volume in downtown Seattle will continue to climb at a rate considerably accelerated by the increased facilities," reports a Field's spokesman.

"Major outlying units can exist profitably in a community like ours," declares Sizer. "Great numbers of customers will come to a downtown area to shop even under the most adverse traffic conditions, provided the proper stimuli are applied . . ."

Helen G. Laycock, sales promotion and advertising manager of the Fair Store, admits that suburban


shopping centers do offer downtown Chicago a challenge. "State Street is set to meet that challenge with continuous and greatly expanded efforts to keep our street and all the rest of downtown accessible by public transportation as well as by automobile — and particularly increase its promotions on behalf of more parking facilities," she says.

Parking Progress

The move to improve parking conditions dates back to 1946 when the Chicago Association of Commerce and Industry and the State Street Council joined in financing a comprehensive downtown parking sur-

(Continued on page 39)

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New Products

Mobile Air Conditioner

A mobile air conditioning unit that can be easily moved from room to room by a housewife is being put into volume production by Union Asbestos and Rubber Company at its Greenville, Ill., plant. The unit weighs less than 200 pounds and is 28 inches high, 18 inches wide and 17 inches deep. The conditioner requires no permanent connections. Water for it can be drawn from any household tap through a flexible rubber tube similar to that used on a bath spray. According to the company, it is powerful enough to cool a 500-square-foot room on the hottest days. The plastic cabinet comes in either dark brown or ivory, and the unit is expected to retail at \$330.

Double-Duty Movie Unit

Both projector and screen are contained in a movie unit announced by the Triangle Continuous Daylight Motion Picture Projector Company of Skokie, Ill. The device resembles a television set and has a 13 by 18 inch screen. It can show up to 1,600 feet of 16mm film (44 minutes' worth) and will repeat the film continuously for up to 200 hours without rewinding. Or it may be set to run only once and repeated by pushing a button. Heart of the unit is a Bell and Howell Film-sound 285 projector. List prices range from \$880 to \$1,403.

Ceramic Building Block

A new lightweight, all-ceramic building block has been developed by Armour Research Foundation of 35 W. 33rd St., Chicago, for use of the Arabian American Oil Company in a housing project in Saudi Arabia. The foundation's ceramics and minerals research department states that it may prove to be an economical construction material for the United States. The 8-by-8-by-16-inch block is composed largely of bloated clay bonded with fused clay. It weighs 22 pounds, is highly insulative, will not chip or crumble, and has a compressive strength of 1,000 pounds

per square inch. Arabian clay was used in the Armour project.

Pipe Insulator

Owens-Corning Fiberglas Corporation of Toledo has announced a low-pressure pipe insulation for cold water, hot water or low-pressure steam lines. The company says that a 1/2-inch thickness of the new insulation equals the performance of 3/4-inch to 1-inch thickness of other materials commonly used in the low-pressure field. The insulation is available with a canvas covering for installation on hot water or low-pressure lines and with a black jacket of asphalt-saturated kraft paper to protect against condensation on cold water lines.

For Part-Time Farmers

For the 2,000,000 part-time farmers who live on small-acreage farms in the vicinity of big cities, Sears, Roebuck and Company this month is introducing the \$598 David Bradley "Tri-Trac," a small three-wheel tractor. The price is F.O.B. factory and does not include twelve implements that equip it for plowing, planting and cultivating and such diverse duties as lawn-mowing and snow removal.

Nuts and Jolts

The Northwest Nut Growers of Portland, Oregon, are setting new production records with the help of the world's first electronic nutcracker which explodes walnuts right out of their shells in unmarked halves. The new Westinghouse cracker supplies a 65,000-volt jolt.

New Porcelain Coating

Bettinger Corporation of Waltham, Mass., says that porcelain enamel coating has a new future. Heretofore, the acid-resistant coating's reflectivity restricted its use in exterior construction, but now the company has developed a dull finish type. Available in pastel shades, its

primary use will be in architectural curtain wall construction.

Miniature Motor

A permanent magnet motor smaller than a standard pack of cigarettes has been introduced by the Pioneer Electric and Research Corporation, Forest Park, Ill. The miniature motor offers horsepower rating from .004 to .0165, speeds from 2,000 to 10,000 rpm, with total weights from .5 to 9 ounces. Optional features include water tight and explosion proof housing, fungicided armature, noise reducer, speed governor and gear reducer.

Box Stitcher

Acme Steel Company's new box stitcher, the N-5 Acme-Morrison, comes in five types—the post, arm, combination post and arm, side seam, and top. The full line can wire stitch all types of corrugated and solid fibre boxes. A small hand lever adjusts the stitcher to handle work thicknesses from 1/16-inch to 1/4-inch. Its formers, flat knives and drivers are reversible for longer life. Acme's new "arcuate" wire stitching method, by which strength-giving arcs are formed into the wire, is used by the machine.

Message Repeater

Michigan Electronics of 854 N. Rockwell St., Chicago, describes its new message repeater as "the machine that talks at the sight of a human being." It is a tiny box about the size of a Brownie camera that automatically talks whenever anyone walks by it. Suggested uses lie in the field of industrial safety and advertising.

New Sprinkler Hose

The first garden sprinkler said to insure uniform pressure throughout its entire length has been developed by the mechanical goods division of United States Rubber Company, New York 20, N. Y. In addition to assuring lawnmowers of an even water supply for their grass and other gardening needs, the new sprinkler hose has special couplings at both ends permitting extra sections of hose to be added. Until the new coupling was developed, says U. S. Rubber, sprinkler hose could not be

lengthened with additional pieces of hose to reach all parts of the lawn.

Make-Your-Own Furniture

You can now make your own contemporary furniture with just a screwdriver and a minimum of skill, says the Sayres Crest Company, by using one of the company's new "Fabri Kits," which include Philippine mahogany table tops and sets of wrought iron legs. The make-it-yourself kits are to be marketed through department stores, retail lumber dealers and hardware stores. The manufacturer is at 1001 Broadway, Seattle 22, Wash.

Absorbent Paper

The Scott Paper Company, Chester, Pa., has introduced a line of absorbent paper wipers for all plant cleaning jobs. Each wiper has two embossed sheets fastened together for greater strength and the wipers are described as being ideal for cleaning everything from heavy machinery to precision parts.

Diamond Wheel

The fastest diamond wheel cutting action on carbide ever developed is claimed for the new "Jetaline Diamond Wheel" developed by the Action Diamond Tool Company, 4545 W. Grand Ave., Chicago 39. Used with a coolant, the wheel is said to plunge cut in a single pass a 1/8-inch slot in a carbide blank one inch long. The unusual cutting action is due to the use of a special alloy metal bond which is non-glazing and non-loading, thus avoiding overheating and the need for diamond wheel redressing.

Lawn Seeder

R. Krasberg and Sons Manufacturing Company, 2501 W. Homer St., Chicago 47, have introduced a hand-operated, light weight lawn seeder that is said to broadcast seeds in a four to five foot wide semicircle in an absolutely perfect pattern in front of the user. The unit, which resembles an outsize flour sifter, can be used for seeding, dry fertilizing and dry weed killing. It will sow any kind of seed including the extra tiny varieties like Merion Blue.

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new files use vertical shelving with adjustable snap-in metal dividers on every shelf. It is reported by the company that per filing inch expense is 67 per cent less than the conventional filing systems. Complete visibility and the elimination of file drawers make for much faster record storage.

Light Weight Bath Tub

A reinforced plastic bathtub weighing only 17 pounds is being made by Lunn Laminates, Inc., Huntington Station, L. I., N. Y. A comparable full size metal tub weighs close to 200 pounds. Other advantages claimed for the plastic tub: less breakage in transit, better styling, non-rusting, "warmer" touch and a lustrous finish that lasts the lifetime of the tub.

Your Next Promotion May Kill You

(Continued from page 15)

and semiannual check-up for those over 60.

General Motors Corporation made a valuable beginning with exact recognitions of facts and figures by starting a program for diagnostic health examinations of its executive group. General Motors had reason to act: 189 of its top management group died in five war years.

New York's Life Extension Examiners checked the health of 25,000 executives, averaging 45.6 years of age. They found that only 20 per cent enjoyed normal good health. Standard Oil of New Jersey had 340 executives report for medical check-up. The test revealed that 235 had

something wrong with their health. Of these, 192 had ills that would materially affect their working lives if they remained undetected and untreated.

Some experts estimate that a \$20,000-a-year executive represents a \$250,000 investment by his company. The American Fidelity and Casualty Company is the source for the statement that the average businessman dies six years before his time, thus losing for the company a sizable part of that investment.

Furthermore, executives are reluctant to admit they feel badly. They go on to the next promotion, undergoing the severe stress and strain often connected with such advancement without complaining and without telling.

Doctors of large business and industrial companies are aware that top management no longer smiles when members of its executive team display such stoicism. The "carry-on" and "suffer-in-silence" schools are not in high esteem when their pupils drop dead at 50 from a usually curable disease.

The relative willingness of executives to submit to a regular program of physical checkups depends largely on how the results of the examinations are handled and on how the executive is handled when he does become sick or when he takes time off for a needed operation.

Where periodic medical examinations are mandatory for the executive group, experience is that cooperation of executives is sometimes lacking. They fear that discovery of any ailment would prejudice the boss against them. Instead of a mandatory checkup, most corporations have changed to voluntary ones, and the results are confidential between doctor and patient. In two large companies, 95 per cent of the \$10,000-and-over executives had taken complete physical check-ups, and the majority were willing to let the results be made available to their superiors.

Twenty years ago, many companies simply wrote off an executive who had a heart attack, a nervous breakdown, or a serious operation. Today, with greatly improved medical therapy, the situation is different. Many people with heart trouble, or

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bad case of peptic ulcer, are able to return to full-time activity and efficiency after a few months.

Dr. S. Charles Franco, associate medical director of the Consolidated Edison Company of New York, emphasizes that the basic medical policy in his company is that periodic health examinations of executives are kept confidential. Otherwise, important details in the medical history cannot be obtained, and a complete clinical evaluation of the patient will be impossible.

Each executive examined is assigned a serial number so that any diagnosis or laboratory report cannot be identified with the person examined. There will always be situations where the health of the individual executive is a concern to management. But in these cases, it is only with the executive's consent and in his interest that the physician makes general recommendations to management. The confidential information is never revealed.

Many companies figure the cost of giving regular medical examinations at \$125 to \$150 a year per executive. Others put the figure from \$35 to \$125. But all are convinced that they are an excellent investment.

Dr. D. John Laurer, medical director of Jones and Laughlin, believes that efficient health programs also pay an extra bonus in morale and better productivity. "When an executive doesn't have to worry about his health," Dr. Laurer said, "he feels better and works better."

Mutual Understanding

Health examinations are also helpful in deciding whether a promotion will be of real advantage to the executive, or whether it might "kill him."

A constructive health program can effectively bridge the gap between the executive of today and the potential executive of tomorrow, if there is mutual understanding of the problem. At least during the first ten years of employment, a complete constructive medical inventory of an employe can be recorded. This will include, according to Dr. Page:

1) Occupational history. The stresses and strains he has undergone; his working environment, promotions, attitudes, desires, and frustrations. All may have a future effect upon his physical and mental well-being.

2) Pattern of his home life and

extra-curricular activities. These are important factors which are often overlooked in planning the future of tomorrow's executive.

3) Complete physical inventory. In addition to the taking of a thorough medical history, and the performance of a complete physical examination, this should include all the laboratory procedures needed. The person's physical make-up and his awareness of the importance of health maintenance should be recorded.

Man should live and work within his resources. Men promoted to po-

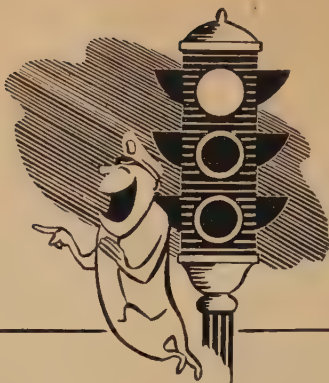
sitions beyond their inherent capacity to fill adequately without strain may be headed for the final crack-up. Executives may be promoted beyond their depth, because they have often an obsessive devotion to their jobs. As Dr. R. N. McMurry in a study on the "executive neurosis" points out, such persons may become over-aggressive, tense, and anxiety-ridden, although this may not show on the surface. A vicious spiral is started of anxiety, hostility, overactivity, and still more anxiety, and so round and round "until suddenly something gives."

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Stop me...If...



Medic: "Is there any insanity in your family?"

Bill: "Yes, I'm afraid there is. They keep writing me for money."

If you want your wife to pay attention to what you say, address your remarks to another woman.

A man wanted to buy a riding horse for his wife and was trying one out. Noticing that the horse required a firm hand and constant watching, he asked doubtfully: "Do you think this is a suitable horse for a woman?"

The owner of the horse was a tolerably honest man, so he answered carefully: "Well, I think a woman could handle the horse—but I wouldn't want to be the husband of the woman who could do it!"

"Some people think that bumming is a bed of roses, but they just don't know what we are up against," griped a Man of the Road. "We sleep in the open. Mostly it's cold or raining or snowing and the park benches are hard. Never know when you'll be thrown in jail, either. Often we go hungry, and . . ."

"Why don't you give it up then?" interrupted his bored listener.

"Huh? And admit I'm a failure?"

It was one of those mountain roads and the tourist stopped to ask directions from a native.

"Pardon me, sir," said the stranger, "can you tell me where this road goes?"

"Well," said the hillbilly, "this road just moseys along a piece, then it turns into a hog trail, then a squirrel track, and finally runs up a scrub pine and ends in a knothole."

An unsophisticated stranger, watching a poker game in a tough town of West Texas, saw the dealer give himself four aces. He moved around and whispered to the player opposite.

"Mister, you better git out from here," said the player.

"But," the stranger insisted, "He dealt himself four aces!"

"Say, you don't understand this here game, podner," the player said. "Suppose he did deal himself four aces? Ain't it his deal?"

Lawyer — "You say you want to get a divorce on the grounds that your husband is careless about his appearance?"

Client—"Yes, he hasn't shown up in nearly two years."

Wife—"I've got a lot of things I want to talk to you about."

Husband—"That's fine. You usually want to talk about a lot of things you haven't got."

"Sir, my stenographer, being a lady, cannot type what I think of you. I, being a gentlemen, cannot think it. You, being neither, will understand just what I mean."

Now, the modern man comes home from work and greets his wife with: "Hyah, honey, what's thawing?"

On a children's query show a boy about seven was before the microphone.

"It's man's best friend," began the M.C., "and the word begins with 'D'."

"Dame," the youngster answered.

Mother: "Isn't this a rather complicated toy for a small child?"

Clerk: "It's an educational toy, madam, designed to adjust a child to live in the world today. Any way he puts it together it's wrong."

A Texan heard that a factory in Ohio was interested in buying bullfrog skins. He wired that he could supply any quantity up to 100,000 on demand. Needing the skins badly, the factory wired him to send the entire 100,000.

About ten days later a single dried frog skin arrived through the mail, with this notice: "Gents, I'm sorry about this, but here's all the frog skins there were. The noise sure fooled me."

Mother to finicky but not fastidious young son at dinner table: "Eat it, dear—pretend it's mud."

Coach to football lineman: "You're out of condition again, Jones. What'cha been doing, studyin'?"

Leo wanted desperately to open his own electric appliance shop but lacked the capital to start.

"Look," said one of his friends, "why don't you get a partner? For instance, I hear Joe Billings is in the same boat as you. Why not sound him out?"

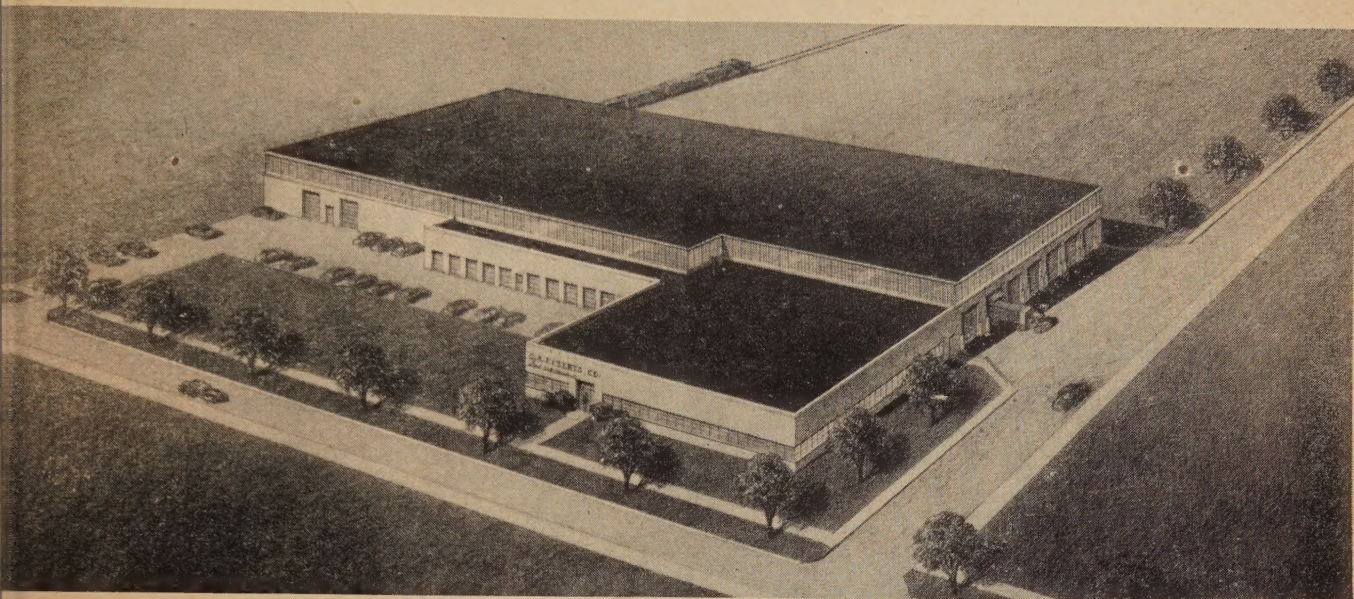
"No," came back Leo's reply. "I know Joe pretty well. He was once engaged to my wife."

"So what has that got to do with it?" asked the puzzled friend.

"Heck, man," snapped the future capitalist, "you don't suppose I would take a smarter man than I am for a partner, do you?"



"You're uncooperative, lazy and irresponsible. Boy, how I envy you!"



Rendering of New Plant now under construction for C. A. Roberts Co.

Four New Plants now Located in Clearing's Franklin Park District

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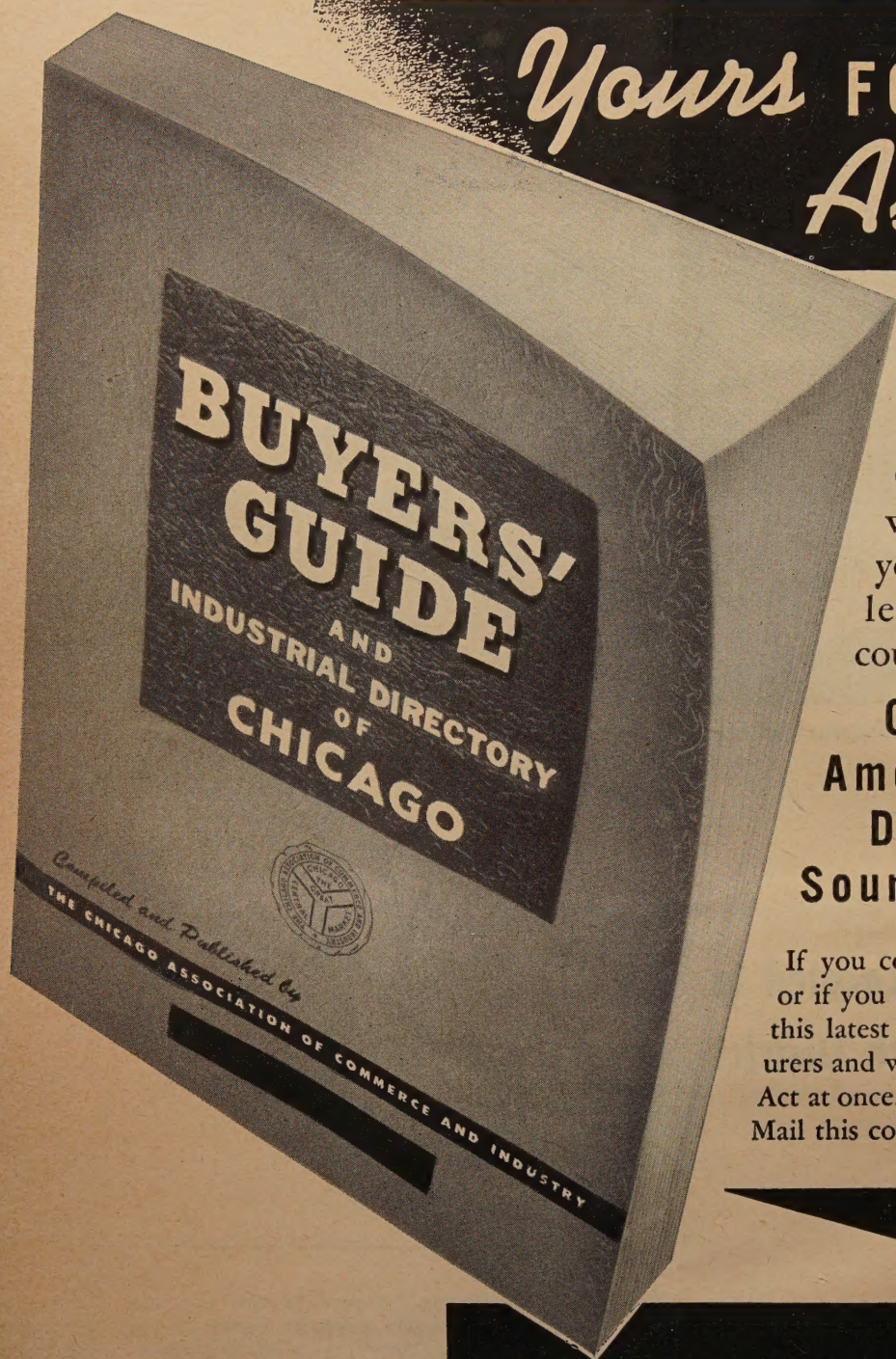
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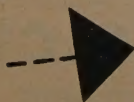


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. . . . doing hundreds of services and operations in the printing, publishing, engraving and binding plants in Chicago—printing center of the world.

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stereo casting
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drying and color setting
humidity control of paper
smoke burning and odor control
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electroplating
mat drying
water heating
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Tribune is bought, read and bought from by hundreds of thousands more families than are reached by any other Chicago newspaper. Their buying attracted to the Tribune in the twelve months ended Sept. 30, 1953 more than \$57,000,000.00 in advertising — more than has ever appeared in any other newspaper.

A Tribune representative will be glad to discuss with you a plan which will help you build a consumer franchise for your brand among the families who read the Tribune. Ask him to call.

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